Learning by Doing: An Introduction

"Learning by Doing" is an approach that assumes that the best way to learn the theory, concepts, and terminology in any subject area is by learning them in the context of hands-on, real-world projects that the learner wants to or needs to do. This introduction provides tips for getting the most learning out of such projects, in the areas of music theory, notation, and acoustics, as well as an overview of the pedagogic philosophy behind learning by doing.

Learning-by-Doing: Practical Tips for getting the most out of these courses

Many courses teach you the theory first and then (maybe) let you practice using them in carefully controlled situations to do things that teachers expect you to be able to do. If you are expected at all to apply the idea in the messy arena of the real world, it is only after you have finished the approved learning. As discussed in detail below, learning-by-doing turns this traditional approach on its head. It assumes that **the best way to begin learning about theoretical concepts is to use them to do things in the real world that you want to or need to do.** The end result may be that you know the theory less thoroughly (so learning by doing may not be ideal if you need a thorough conceptual background), but you understand the most useful concepts more deeply and can use them in the real-life situations that matter to you.

Note: At the time of publication, I am also publishing five learning-by-doing courses in the area of music: a course on Reading Rhythms written in common notation, suitable for any instrument (including voice and body percussion); a course that helps guitar tablature readers learn common notation; and three **courses that can be used without learning to read common notation**: Music Theory for Digital Audio Work Station, Music Theory for Guitar, and an Exploring Music Theories course for those who would like to learn more about unfamiliar music traditions. Please note that these are all short experimental courses. Feedback is much appreciated,

and I will expand and refine the courses based on reader response and interest.

To get anything out of these courses, you must do some of the activities! Do not just read about them, and do not just imagine yourself doing them. Because human beings have very vivid imaginations, it is actually quite easy to imagine doing something well, and thus fool yourself into believing that you "get it," when in practice you would actually struggle to do it or understand it. Simply reading about an idea without experimenting with it yourself is about as useful as watching an exercise video without doing the exercises. **You don't have to do all the activities** suggested in a module, just the ones that are most enjoyable or most closely related to things that you need to or want to do with music in your real life. And in the spirit of learning by doing, you should always **feel free to adapt the activities** to better fit your immediate music-learning projects and goals.

Also, be prepared to **take the course slowly, as if the point is to enjoy the process rather than to get to the end of the course**. Concepts are introduced one at a time, with invitations to explore each one before proceeding to the next. The payoff to the slow approach is that whenever you take time to let an idea become familiar, it not only becomes more useful for real-world activities, it also becomes more useful for learning about other concepts! Over the long run, you are laying down a foundation that will eventually help you understand the more advanced concepts more quickly and easily. As each concept becomes useful and familiar, it is also less likely to be completely forgotten, and easier to re-learn, even when you set it aside for months or years.

If a concept is familiar to you, it is of course fine to move past it quickly or even to skip it altogether. **How do you know when a music concept is familiar enough to move on?** Can you:

- Recognize it when you hear it in real music?
- Write out an example of it, or point out an example in written music?
- Demonstrate it using your body (for example by singing, humming, or clapping)?

- Play an example of it on an instrument?
- Demonstrate a counter-example? In other words, can you hear or sing or play something that is definitely NOT an example of the concept, and explain why it is not?

If you cannot easily do at least two of the activities in the list, with confidence that you are correct, then don't be in a hurry to move on. Play with the idea more than once, over the course of several days or even weeks, until you can confidently recognize and DO (hear/play/write/sing) the concept. The slow pace should not be frustrating if you choose activities that are at an interesting level (not so easy that they are boring, and not so difficult that they are frustrating) and that are related to your own music goals. Do you want to be a more knowledgeable listener? A better improviser? A better music reader? Do you want to play by ear? Compose or arrange music? You'll know you are really learning-by-doing when it's difficult to draw a line between learning about theory and doing your favorite or ideal music activities. To help you out with this, there is a wide variety of activities to choose from in the modules in these courses, and most of the activities are described in general terms, so that you can easily adapt them to your goals and situation.

Finally, the activities come with suggestions for gathering feedback, so that you know whether your use of the concept fits with other people's understanding of it. **Take the feedback steps seriously.** One of the main uses of music theory, notation, and acoustics is that they are useful for discussing music with other people, so you will want to make sure that your interpretation of the concepts is reasonably similar to theirs. Shared concepts can also help you create music that other people like, so again, you want to make sure that your idea of how to use a concept is in line with what other people expect and enjoy. Again, the key to not getting frustrated is to not be in a hurry. If feedback, from others or from your own careful listening, suggests that you might be misunderstanding a concept or not using it well, try to work out a way to make the activity easier, or to get some help from a more experienced musician, or to switch to a different, easier activity for a while. Also, if feedback suggests that maybe you don't understand an idea or term that you thought you already understood, don't hesitate to go back to previous modules and try to work out what is causing

your confusion. From the perspective of learning, it is particularly worthwhile to work through your confusions until you have found the root of the problem, because the resulting “aha” moment is usually a significant step forward in your understanding.

Please note, however, that negative, unhelpful feedback on your personal projects can be terribly demotivating, and psychologically harmful. See Providing Constructive Criticism in Music for information on how to provide or ask for feedback that is both useful and psychologically positive, or, when you cannot get feedback from others, how to usefully critique your own work. The activities in this course also include plenty of pointers for keeping feedback positive and useful.

Here is a quick summary of the above tips:

- Whenever a concept is not already familiar and useful to you, do some of the suggested activities regularly until it becomes familiar and useable.
- Don't be in a hurry to move on. Try to find activities that you enjoy or want to be able to do, so that you will be content to explore each concept until it becomes very familiar and easy to use.
- Gather positive, useful feedback in order to make sure that your understanding of the concept is well connected to the understandings and preferences of others.

The Philosophy behind Learning-by-Doing

You don't have to understand the philosophy in order to do these courses; feel free to skip the rest of this module and move on to the hands-on modules if this does not interest you. Read on if you are not sure whether this approach is right for you, or if you think that understanding the philosophy will help you be more successful in using it.

The goal of a learning-by-doing course is to help you make useful connections between the activities that you actually need to or want to do in the real world and the relevant theoretical concepts and terms that can help you organize and think about those activities. The basic ideas behind learning-by-doing are:

1. All theoretical concepts are somehow useful for real-world activities.
2. General theoretical understanding always begins with specific real-world understanding.
3. Practical activities that you actually want to or need to do are the best place to begin understanding the concepts.
4. Getting feedback on real-world projects is also the best way to check whether or not you have a good understanding of the concept.

1. Using theory to do things in the real world

All theoretical concepts are somehow useful for doing things that people need to or want to do; otherwise nobody would have bothered to invent and share them. (Some of them might only be useful to professional physicists or linguists, for example, but they are all truly useful to some group of people!) The real-world uses are actually the main point of the theoretical concepts. Even if you have studied a concept to the point that you can define and discuss it, if you haven't actually used it to do something that "needs doing" (as opposed to "doing" a coursework-type problem), you really have only a vague idea of what you are talking about. That vague idea might be so limited or misleading that when you do find yourself in a situation in which it could actually be useful, you may not know how to apply it, or may not even realize that it is applicable!

A theory-only concept is, by its nature, a weak spot in your understanding. Because it is weak, it is difficult to build on. Consider, for example, these two fake definitions: “A mibble is a brown animal with a long tail” and “A fliss is a deciduous angiosperm with an actinomorphic calyx.” Although the definition of “mibble” is not real, you could probably use it, because it is based on familiar concepts like “brown” and “animal”. If required, you could use it to:

- name examples of mibbles
- decide whether any specific animal can be classified as a mibble
- answer simple questions about mibbles (such as “Do any of them make good pets?”)

- understand mibble-dependent concepts (such as “a mibble-ty is a mibble that can swim”)

Unless you know a lot about plants, you are probably having more trouble with flisses. Even if you memorize the definition and look up the meaning of all of the words, could you decide whether or not a certain plant qualifies as a fliss? Could you answer simple questions about them (such as “Do any of them make good house plants”)? How certain would you be of your answers? The problem is that terms like “deciduous” are, for most of us, a bit theoretical. Even if we see deciduous plants every day, we don't use the idea “deciduous” to do things in their own lives. “Brown,” on the other hand, is an idea that we use to do things in our own lives, such as deciding which pair of shoes to wear. Brown is not a merely theoretical concept; it is practical, useful, familiar and comfortable.

Of course, if your job involves deciding what type of trees to plant, then “deciduous” becomes a very useful and comfortable term, too. If you want music theory to become familiar and comfortable, this practical approach is just what you want. For example, you probably hear "perfect fifths" in music all the time, but you don't think of them in those terms, just as you don't think of the trees that you walk past as being deciduous. But if you start using the term “perfect fifths” to do things, such as deciding what notes to use in an improvisation, “perfect fifths” will eventually no longer be a vague theoretical concept; it will become a practical idea that you are comfortable using to describe the sounds that you hear or make.

Note: You should note, however, that learning all of the conceptual information at once, in a clear, formal, structured format, is usually faster and more efficient, so if you are certain that you will need a wide and deep conceptual understanding of a certain area (for example, if you will need to be able to formally analyze contrapuntal music), you may find traditional-style courses to be a better option for you than learning by doing.

2. Starting with specific understanding

General understanding starts with specific understanding. Nobody's understanding of an unfamiliar concept begins as a complete overview. You start with one or two clues, based on a formal definition or a few examples or the way someone else uses the concept. Your first idea of it will almost certainly be incomplete or even partially mistaken. As you start trying the idea out for yourself, you and other people may notice mistakes in your use of the concept that are caused by incomplete understanding, rather than by a simple need for practice. The mistakes can be frustrating, sometimes even embarrassing, but they help you get a clearer, more complete and accurate idea of what the concept means and how to use it.

As you get more comfortable with a concept, you may start to notice that there are different ways to use terms, or that different people use different terms for the same ideas. This is because they have had different experiences with the terms and concepts, for example using them with different groups of people, different styles of music, or different instruments. The more comfortable you are with a concept, the easier it becomes to work with other people who have had different experiences or use different terms to talk about it. Four-year-olds who have had different experiences with plants may have trouble discussing “plants” with each other. Biologists who have had different experiences not only have little trouble using the term “plant” with each other, they also have little trouble accommodating a four-year-old's understanding of the term. You will find the same is true for music theory; the more you learn about how it is relevant to what you do, the easier it will be to talk to all kinds of musicians about what they do.

3. Doing things that you really want to or need to do

Using theoretical concepts to do practical things that you actually want to or need to do is the best way to get to know the concepts, because it helps you understand what the concepts are for. This “big picture” understanding will also help you recognize other specific ways that you might be able to use the concepts in your life, which will help you keep them in mind rather than forgetting them. Working on something that really matters to you personally will also help you work through those moments when you realize you are

doing something wrong, instead of quitting in frustration or deciding that you are “not good at it.”

Note that **“needing to” do an assignment for a class does not count as learning-by-doing, unless you feel that the goals of the course and of the assignment are relevant to your real life.** (And getting a good grade in the course does not count as a learning-by-doing goal, because in that case, what you are “doing” is getting good grades, not making music.) For example, if the goal of a course is to be able to write a chorale in the style of Bach, then this is not learning-by-doing unless you yourself need to or want to write Bach-style chorales, or unless you know how the assignments will help you reach your own goals. If you will need to write Bach-style chorales for your dream job as director of a choir, then that is learning-by-doing. If your goal is to write Chopin-style etudes, or Beatles-style songs, and you can see how the exercises in functional harmony and voice-leading will help you do those activities, then that is also learning-by-doing. On the other hand, if the teacher knows how the assignments could help you reach those goals, but you don't know, that does not count as learning-by-doing. In that case, the teacher has the practical knowledge, not you. To you, the ideas are still theoretical; they are about “how someone would do that” as opposed to “how I could do this.”

Learning by doing is not a new idea at all, nor is it particularly controversial; the ideas behind this course have been explored by educators and approved by psychologists for decades. (If you would like to learn more about the theory behind these courses, I recommend reading about inquiry, inquiry-based learning, project-based learning, or active learning. The writing of John Dewey is a personal favorite of mine.)

However, the ideas can be challenging for teachers to implement in traditional school situations. It is difficult to provide students in school with the opportunity to do the things that directly interest them, because different students in the same class are probably not going to be truly interested in the same activities. So formal education sometimes simply gives you the theoretical concepts, without making you use them at all. When this is the case, unless the information itself catches your interest, you usually forget it as soon as forgetting is allowed (in other words, after the final test).

Good formal education include activities that interest some people, usually the experts in that subject and those who want to become experts. For example, you might be asked to use physics to design a safe bridge, or to use literary skills to analyze Shakespeare, or to use music theory to write a chorale. These activities help you to make sense of the concepts, which helps you remember them. They also give you some idea of what the concepts are for, but these “expert uses” may not give you much idea of what you yourself might be able to do with the concepts in everyday life.

For example, you might use physics to help you do skateboard tricks, use literary skills to discuss a favorite novel at book club, or use music theory to write a rock song. Often, teachers are so familiar with the concepts that such everyday uses are obvious to them. They may not realize, or may forget, that everyday uses are not obvious when concepts are new and unfamiliar; or they may feel that everyday uses do not belong in formal education. However, if you don't start using the concepts yourself in everyday life, then without practice you eventually forget the concepts or forget how to use them. So, once you decide to learn more about a subject on your own, it is useful to abandon the formal-education approach and set out instead to find ways to use the concepts in projects that you want to or have to do as part of your own real life.

Modern technologies are making it easier to offer learning-by-doing within a course setting, but many courses use modern technology for other reasons. If you prefer this type of learning, or want to try it out while guided by an experienced teacher, look for courses that are so flexible that students are expected to help set their own goals, activities, texts, and materials for the course. Note that if there are courses that are closely aligned with your own goals, a traditional-style course may be a better choice, because it is carefully designed to get you to the goal as quickly and efficiently as possible.

4. Getting feedback on real-world projects

Again, in a formal-education setting, getting feedback usually means being told that you are “right” or “wrong” when you discuss or define the

concept, or use it to solve a clearly-defined, expert-use type of problem. Since this is feedback on a theoretical level, it doesn't give you a good idea of whether your own understanding of the concept is useful for the not-so-clearly defined problems you meet in the real world. In contrast, feedback on your own projects is feedback at that real-world-usefulness level.

The real world itself may provide all the feedback you need; for example, if you misunderstand the physics of skateboarding, gravity and momentum may supply some very practical and memorable feedback. Similarly, if you try to use concepts from a write-Bach-chorales course to write a pop song, your own ears may tell you that something about the way you are using the concepts is not right.

However, if the concepts you are trying to learn have a large social component, then feedback from other people is also very useful. For example, the reactions of other people to your pop song are a source of useful information, and feedback from another musician who can perhaps help you locate specific reasons why the song isn't working well can be extremely useful.

Interestingly, there is a lot of evidence that feedback does not have to come from experts to be useful. This is why, for example, so many rock and pop musicians manage to “teach themselves” how to play simply by being in bands with other musicians who are at the same level as them. Band members give each other helpful and encouraging feedback, because that makes the entire group sound better, and in this way they simply work out together how to make music that sounds good to them and to their fans.

However, such self-taught musicians often don't have a clear understanding of theoretical terms and concepts. A knowledgeable musician can more easily provide useful help in this area, perhaps even to the point of being able to explain to you what you are misunderstanding and why and how that is affecting what you are doing. But when such feedback is unavailable, keep in mind that anyone who understands the principles of constructive feedback and is willing to listen carefully can provide clues that will help you better understand what you are doing.

Exploring Music Theories: Introduction

A theory of music is the terms and concepts used to discuss and understand the sounds that are used to create the music. When groups of musicians use different approaches to making and understanding musical sounds, they therefore also use different music theories. Studying the theory of a particular tradition can provide insights into that tradition, even for novice listeners. This course provides a method for such study that is personalized to reflect the learner's current music theory knowledge and interests.

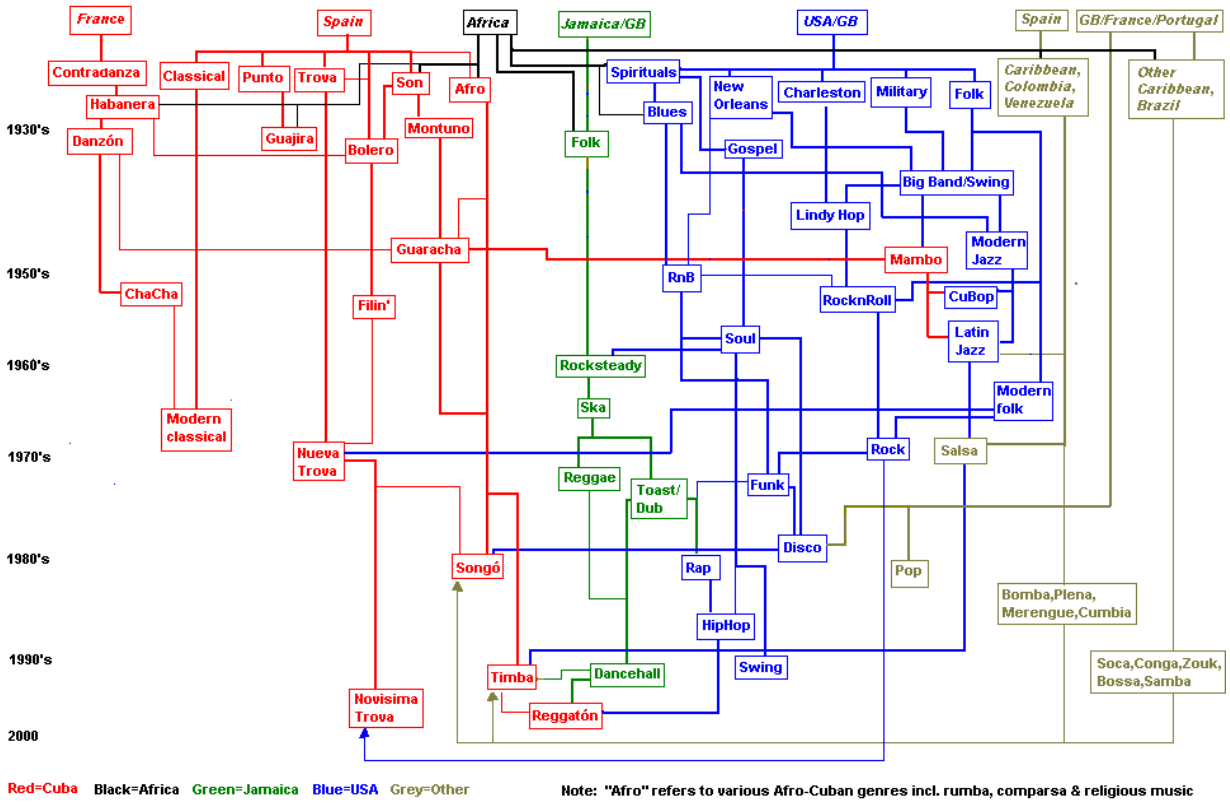
Exploring Music Theories is a learning by doing course intended to help you explore the theories of music traditions that are not very familiar to you, or to compare different music theories to each other, or to explore music theory itself as an idea. For general information about learning-by-doing courses, see Learning by Doing: An Introduction. The course introduction below includes:

What makes a music tradition “unfamiliar”?

The term “music theory” is often used to refer specifically to **common practice**, the music tradition featuring chord-based harmonies in major and minor keys. It originally developed in Western Europe but is now a part of many music genres and styles that are popular all over the world. In a more general sense, **a theory of music** is simply the way that any group of musicians thinks about and discusses what they do when they make music. It includes the concepts and terms that they use and the relationship between those concepts, the musical sounds they make, and the ways they practice, rehearse, perform, and teach their music. Very different approaches to music have developed in various times and places, including of course different theories to describe and explain each music tradition.

Note: In this course, the term **music tradition** is used very informally, to refer to any group's long-standing practices regarding a particular style, genre, form, or type of music. It can include widespread, general traditions, such as practices that are typical in many (but not all) common practice music genres, but also more specific, local traditions, such as the practices that are specific to Cuban jazz.

Insiders to any music tradition are those who have grown up hearing the music, in their own culture, in personally-meaningful contexts with family and friends. The music is as comfortable and familiar as a native language. Insiders include people who do not think of themselves as musicians, but who still "understand" the music when they hear it, as easily as they understand someone who is speaking their native language. They also may pick up some of the basic terms and concepts unconsciously, without formal study. For example, most English speakers who listen to common practice music with friends and family develop a general idea of the meaning of words such as "harmony," "melody," and "beat," even without formal music education. Insider musicians sometimes learn formally from a teacher, but many learn how to make the music with little formal help, simply by imitating what they see and hear other musicians do.



There are very many different music traditions, styles, genres, subgenres, and fusions. Nobody can be an "expert" in all of them; you are an "insider" to any music that you and your friends and family listen to often, as a matter of course or choice in your daily lives.

Outsiders to a music tradition are those who do not hear it until later in life, or who hear it only occasionally, as music that belongs to some other group of people. The “others” who are insiders to the tradition may be a different nationality, ethnicity, class, or religion, or they may be people of a different time or generation. Outsiders do not find the music easy or natural to understand, because they do not have the necessary personal and cultural references needed to make sense of it. They experience it as “exotic,” and may even find it unpleasant or “noisy.” Even if they enjoy the music, outsiders come to understand it only through effort and study, as if it were a foreign language.

Why study a music tradition's theory?

Music theory has a reputation for being an advanced course of study that has little or no practical use for most people. This reputation comes from the widespread practice of teaching “music theory” in a classroom, from a textbook, with examples drawn only from classical music traditions. Actually, basic music theory is so useful that almost everyone knows a little bit of the theory of their own tradition. **A theory of music simply comprises all of the concepts, terms, and symbols that are used by any group of musicians to think about, discuss, remember, and pass on, what they do when they make music.** Even if you have never formally learned anything about music, you almost certainly have some idea of what familiar musical terms and symbols mean. For example, if you are an insider to common practice music, you probably have some idea of what is meant when musicians talk about “instruments,” “notes,” “rhythms,” “the beat,” “the melody,” “verses,” or “chords.” Your idea of what these terms mean (in essence, your personal theory of music) may not be exactly the same as a professional musician's idea, but it is probably close enough to be useful.

Music traditions that sound very different from each other tend to have different theories. In other words, an unfamiliar music tradition may use different words to discuss its music, and different symbols to represent it. (Different words and symbols may be used even when the music sounds the same, for example the terms used in various languages to discuss common practice music.) Whether you are an insider or an outsider to a music tradition, you do not need to learn its theory to develop an ear for, and enjoyment of, its music. However, knowing some of the terms and concepts may help you develop your ear and enjoyment more quickly. It will certainly make it easier to discuss what you are hearing and ask questions about it in ways that makes sense to insiders.

Learning some of the theory can be even more useful if you are a musician who would like to actively explore, borrow from, practice, or perform, the unfamiliar music. Understanding, appreciating, and exploring the music of other religions, ethnicities, and countries is typically seen as a sign of cultural courtesy and tolerance. However, **musicians should always use**

caution and consideration in performing or borrowing music from traditions to which they are outsiders. Without in-depth insider knowledge, they risk unintentional offense. For example, their use of various aspects of the tradition may be considered inappropriate by insiders, or may sound like an ignorant parroting, or a cruel parody or caricature, of their music. When a style of music is strongly associated with a particular country, ethnicity, or religion, there is also the risk of being accused of **cultural appropriation**, that is, stealing the cultural treasures of another group without its permission. Working with a teacher, or band member who is an insider to the tradition is strongly recommended, in order to avoid superficial or offensive performances.

In spite of the risks involved, one of the most interesting developments in music over the past couple of centuries, particularly in recent decades, is the amount of interaction between different groups, as musicians in one tradition borrow from or "quote" a different one, or include an aspect of it that intrigues them, or even create a "fusion" of the two.

In this climate of experimentation, many musicians are interested in learning about unfamiliar musics, but some do not have easy opportunities to do so. One barrier is a lack of music theory introductions that are designed for outsiders; the common assumption is that you will find a teacher or group to join that can provide the needed insiders' perspective. That is indeed the ideal pathway, and if you do find an insider who can help you learn about the music, this course may not be necessary, or may simply suggest topics for discussion and lessons. If that pathway is not feasible for you, this course is meant to help you start or continue to explore when active help from insiders is not easily available.

What will you need for this course?

Because of the lack of aural and cultural familiarity with the music, learning from the outsider perspective is always a challenge that requires patience. It will be useful to adopt the **expectation that, without active guidance, learning will take place at a leisurely, lifelong-hobbyist pace**, rather than at an intense college-course pace. Bringing **specific goals** to your learning project – specific questions that you have about a music tradition, or

specific things that you want to be able to do, is not necessary, but it may help you keep track of your learning progress. As you satisfy one goal or answer one question and become more familiar with the music, higher-level goals and questions are likely to arise.

You **do NOT need to know any music theory or notation** to begin with. The goal is to explore music theory at the most basic level, which is the terms and ideas that are most familiar and "obvious" to insiders who listen to that music, in order to provide a basic orientation for learning more. Concepts will be introduced using general, non-musical terms that are relevant to any music. The course is based on the assumption that there are some fundamental characteristics that are shared by all kinds of music, no matter how different they sound:

- All sounds are vibrations, or waves, of air. These vibrations can have different **wavelengths**, which can make them sound "higher or lower" than each other. They can also have different magnitudes, which affects their **volume** (how loud or quiet the sound is).
- Sounds are always experienced in time. They can happen **simultaneously** or one-after-the-other in **the flow of time**.
- Musical sounds are created using some sort of **instrument** (in this course, voice and "body percussion" such as hand claps are included as instruments).
- Music is created to be shared among a group of people, who agree on ways that the sounds should be **organized** to create musical **meanings** shared by the group. Any basic aspect of sound can be used to help organize it, including frequency, volume, the flow of time, simultaneity, instrumentation, and participation. The group's musical traditions also include an understanding of who, how, and when various people should **participate** in the music, as well as ways to **remember** the music and pass it on.

The concepts are therefore divided into modules that focus on each of these basic, unavoidable aspects of music:

- organization and meaning
- remembering
- instruments

- participation
- volume
- flow of time
- wavelength
- simultaneity

You may choose do the modules in a different order. For example, if you are most interested in the way music is structured in time, or believe that terms related to timing will be the easiest place for you to begin, you may want to do that module before the one on instruments. There is also no reason not to skip back and forth among the modules, doing each activity as it becomes more feasible, more interesting to you, or most useful for immediate progress. As you become more knowledgeable, you may also find it useful to revisit some modules, to repeat some of the activities at a higher level of understanding. However, **it is recommended that you begin with the modules on "organization" and "remembering."** The "organization" module may help you notice which aspects of the music are most interesting to you or easiest for you to notice, which may help you decide what you want to explore next. The module on "remembering" will include suggestions on how to keep track of, and remember, what you are learning.

For each concept, there will be a general introduction that begins with terms that are not specific to any particular music tradition, followed by suggestions for activities to help you understand how the concept is used and understood in the music that you want to study. Suggestions are divided into categories:

- Researching to discover insider terms and concepts
- Listening for the concepts in the music
- Using the concepts to join in with the music
- Creating or playing the concepts for yourself
- Connecting what you learn to the aspects of music presented in other modules

Learning by doing means that you have to become actively involved with the music and the concepts in order to learn. Actively engaging with a concept – figuring out how to actually use it for yourself - helps you

remember it longer and understand it more thoroughly. However, **there is no need to do all the activities.** Focus on the ones that are most feasible, meaningful, productive, and interesting to you. In general, you should find it easier to make progress if you begin with research, followed by listening and joining in, and finally experimenting with the sound-concepts for yourself. However, at times you may find it more useful to do activities in a different order. As a general rule, the activity to do next is one that you currently find interesting and challenging but doable. If all of the suggested activities seem too difficult, see the list of suggestions below.

For the "researching" and "listening" activities, **you will need access to online or hard-copy texts about the music that interests you, as well as access to plenty of audio examples to listen to**. The course itself does not include the information and audio examples that you will need. It is impossible to include all of the basic theory from all music traditions without becoming an encyclopedia rather than a course. I will provide specific examples of the types of concepts you are searching for. I will try to give examples from a variety of traditions, but most will be drawn from common practice music, in part because that is my area of expertise, and in part because it is the most widely familiar type of music. (If you have suggestions for additional examples from other traditions, please do contact the author.)

For the "joining in" and "playing" activities, **you do not need to play any particular instrument**. In fact, if there are no instruments that you feel comfortable playing, you may want to try doing only the researching, listening, and some joining activities. However, **you may get much more out of the course if you can find some way of making sounds for yourself**, rather than only listening to the sounds that others make. There are several different **options that each have strong and weak points**:

- Playing a **familiar instrument** from your own music tradition allows you to explore a variety of sounds easily and comfortably, but those sounds may not be authentic or accurate representations of the sounds of other traditions.
- Playing an **instrument from the tradition** that you are studying is a more authentic path to exploring it, but being an outsider may make it

difficult for you to make, and even to hear, the correct sounds.
- Using a **digital audio workstation**, or other computer-based sound-creation tools, may allow you to control various aspects of the sound more deliberately and precisely than an instrument that you have to play in real time, but only if the DAW you are using has the specific control features that are needed to do this, and you know how to use them. If you have experience using a DAW, it is recommended that you at least try to find ways to use it to explore the unfamiliar tradition. This may enhance not only your understanding of the music, but also your ability to use your DAW to create music that interests you.
- Following the course **with a group** can increase the types of sounds that you can actively explore, particularly if group members play a variety of instruments. It can also save time for each group member, by increasing the base of available knowledge and experience, and the number of people doing the research. However, organizing this can be difficult and time-consuming, particularly if you cannot find others whose current interests and capabilities are similar.

What can you do to prepare for this course?

You may decide after reading the previous section, or after trying some of the modules, that the activities suggested in this course are currently too difficult for you. Consider the following suggestions in light of the types of difficulties that you are having, or think you might have.
Any of the following may help you prepare for this (or a similar) course:

- **Spend more time listening** to examples of the unfamiliar music that interests you. Listen purposefully and carefully to favorite pieces until you can easily distinguish and describe in your own words various aspects of each piece.
- **Watch performances** of the music. Videos are great if you cannot attend live performances, but attending live performances and interacting with others who are there is even better.
- **Take a course that focuses on listening** rather than on doing. (See, for example, the Sound Reasoning course available at this site.)

- **Learn an easy-to-play instrument**, either in your own music tradition or in the unfamiliar tradition that most interests you. For example, common practice includes several instruments that are considered easy to learn to play at a basic level, including guitar, ukulele, keyboard, and recorder. Whether you learn on your own or with an instructor, take advantage of any opportunities to learn and understand the terms associated with the music you play on the instrument, and to learn the ways (such as notations) that players of the instrument use to remember the music and pass it on.
- **Learn to create and manipulate sounds using a digital audio workstation (DAW)** or other computer-based sound-creation tool. Specifically, being able to purposefully manipulate the wavelength (or frequency), volume, timing, and overall organization of the sounds, as well as the "virtual instrument" used, will prepare you to use digital tools to explore music theories. I cannot recommend a specific commercial DAW, because the right instrument for you will depend on many considerations (such as cost, and your preferences for making music and for learning new software programs). If you would like to try a free, open-source program, (at the time of publication) I would recommend Audacity or LMMS.

Title

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Exploring Music Theories: Organization and Meaning
Music is sound organized by people to express ineffable (as opposed to language- or code-based) meanings. Exploring the ways that a music tradition organizes its music can help you listen to, understand, and discuss pieces in that tradition.

Note: This module is part of Exploring Music Theories, a learning by doing course intended to help you explore the theories of music traditions that are not very familiar to you, or to compare different music theories to each other, or to explore music theory itself as an idea. It is a short experimental course that will be refined and expanded if there is sufficient user interest and feedback.

Introduction: Audible organization helps everyone keep track, and make sense, of the music

What is the main difference between noise and music? There are many good ways to answer this question, but one way that is generally useful is that noise is random sounds that have no human-communication meanings. Music is sound that is organized by people on purpose, to communicate meaning directly through the effects of the sound, as opposed to through a language or code. (Musical meanings can of course be combined with language meanings, as they are in songs. And many sounds have meanings not related to purposeful human communication, for example bird calls or the sounds that “mean” that an engine is not functioning properly or that someone just closed a door.)

Music may be trying to communicate anything from a dance beat to a mood to a story. The success of the communication – whether the listener “gets” the music - depends in part on whether the listener is familiar with the style (tradition, genre) of music, just as success in other communications depend on whether the receiver is familiar with the language or the code that is used. Even well-organized music can sound random, rather than meaningful, to an outsider who does not know what to expect or listen for.

This course is meant to help you begin to hear and understand the meanings in unfamiliar musics, by learning a little about their theories. You can also use it to think about the basis of a familiar music theory, or to compare different music theories to each other. The theory of a music – the terms that are used by insiders to discuss and understand it – are clues to what they hear in it and how its meanings are communicated.

What makes the organization of sounds audible and comprehensible? As a general rule, repetition is the primary way to organize sound in a way that listeners can grasp. Repetition happens at every level, from repeating single sounds (such as a note of a particular wavelength made on a particular instrument), to repeating specific clusters of sounds, to repeating short or long sequences, to repeating all of the sounds that have happened over the course of many minutes. Constant exact repetition soon loses interest, of course, so change is also an important aspect of musical organization. Any repetition may be as similar as possible, or may be purposefully altered, to create interest. Terms that discuss music organization typically refer to ways that repetition and change are used. For example, in common practice music, a second **verse** is a repetition of the music of the first verse, with small changes to accommodate a different set of lyrics (sung words). A **refrain** or **chorus** is a section that is repeated with the same lyrics.

An Analysis of Overall Form

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Most pieces of music have an overall form based on large sections of music that are repeated (more or less exactly) during the

piece. Hearing and understanding the form helps listeners keep track of, and understand, what is going on in the music. This type of understanding can be informal and subconscious (especially for insider-listeners), or formal and conscious.

There are many aspects of sounds that can be repeated or changed, including their relative timing, volume (loudness), frequency (high- or low-ness), instrumentation, and combination with words or actions. Each music tradition develops its own favorite ways to organize all of these aspects of sound. These favorite approaches to repetition and change become so familiar that listeners can keep track of what is going on in the music, and absorb its meanings, without any formal musical knowledge, and even without consciously paying attention. As an outsider to a tradition, consciously knowing what to listen for, as the music repeats and changes, can help you purposefully listen for the kinds of signals that help insiders make sense of the music. The types of repetitions and changes that are most noticeable, either to you or to insiders, may also be the best place to focus your conscious attention. For example, if repetitions and changes in timing are clearly fundamental to the way the music is organized, or are particularly easy for you to follow, then concepts that discuss timing may be a good place to begin studying the music.

Research organization terms and concepts

As you research the music tradition that interests you, make sure you keep notes that will help you remember what you have found and where you found it. It may take you some time to reach those “aha” moments when you are certain that you can hear the way that the music is organized. You may want to be able to refer to descriptions and examples that you have seen previously, whenever you do believe that you have heard an example of a concept for yourself, or when you find descriptions that seem particularly useful, or when you are trying to understand how one term or concept is connected to another.

Search for **general terms and concepts that are used to discuss and describe how music is organized**. In common practice, terms referring to how a piece of music is organized fall under the general heading of **form**, so you may find it useful to look for terms related to "form" in the tradition that interests you. Common practice also tends to refer to large portions of the music that are easily distinguished from other portions and that may be repeated, as **sections** of a piece. Again, this term is so common that it may also be used in other traditions, but other traditions may also have their own terms that refer generally to "how the music is organized" or refer to large portions of the music that are repeated.

Note: The term **piece** is used very informally and generally in this course, to refer to anything that you perceived as being an individual and complete example of music. Sometimes you may feel that various performances are "the same piece," for example when you hear different orchestras playing Beethoven's Ninth Symphony. At other times, you may feel that a specific recording captures a unique piece that is easily distinguished from any other performance, for example when you hear a recording of an improvisation by Ravi Shankar.

Search for **terms for specific types of repetitions**. For example, the following terms are used to discuss specific types of repetitions in Western classical music:

- motif or motive
- ground
- fugue
- round

Search for **terms that are used to refer to specific parts of the overall organization**. For example, the following terms are used in so many popular common practice traditions, you may also find them to be useful in researching other traditions:

- verse
- refrain
- chorus
- introduction
- coda

If the tradition includes formally analyzing the organization of pieces, you may find it very helpful to adopt their **methods of analysis**. For example, in common practice, “form” is often analyzed using letters to represent each repetition. For example “AABA” means “the same musical event happens twice, then something different happens, then the original event is repeated one last time.”

If the tradition includes a way to write down (or notate) the music, **terms that refer to the way repetitions are written** also provide clues about organization that you may find useful, even if you don't plan to learn to read the music fluently. If you have access to examples of the written music, you may be able to follow along sufficiently to be able to “see” the elements of organization, which can help you hear those elements when you listen to the music. For example, common-practice terms that refer to written repetition and organization include:

- Repeat dots
- Endings (for example the “first ending” and “second ending” of a section)
- Double bars
- Da Capo
- Dal Segno
- Coda

When specific ways of organizing music become very common within a tradition, they may use **names that signal standard ways of organizing a piece**. For example, in common practice, when a piece includes one of the following words in its title, that signals that it is organized in a specific way associated with that term:

- Minuet, mambo, polka and other names of traditional dances

- Symphony, sonata, concerto, rondo, fugue, and other terms associated with Western classical instrumental performance traditions
- Round, anthem, and other terms associated with Western classical vocal traditions
- Mass, march, and other terms reflecting expectations that the music fits a specific public rite, ceremony, or celebration

You may also want to read about **language- or culture-based meanings** that insiders associate with typical ways of organizing music, or even with specific music-organization categories. For example:

- Try reading descriptions and discussions of any dances, rites, ceremonies, celebrations, or other traditions that require the music to be organized in a certain way, or watch videos of them.
- Try reading (or watching) a version of the story that served as inspiration for the organization of a piece.
- Try looking up the literal meanings of terms that are in a foreign language. For example, for historical reasons, organizational directions in common notation often include Italian words, even in English-language publications. "Da capo" is literally "to the head," meaning "go back to the beginning" (which is at the top, or head, of the written page).

Listen for organization in the music

1. Find several audio examples of pieces in the music tradition that interests you. If possible, find at least one or two in which you know how the music is supposed to be organized, or know a few of the terms that should apply to the way the piece is organized. (For example, you may have found a discussion of the piece that mentions an AABA form, or that discusses its verses and refrains.)
2. Listen to each piece numerous times, until you can hear at least some of the ways that repetition and change are used to organize the piece so that listeners can keep track of what is happening. Do you believe you can apply any of the terms you have learned to what you are hearing? You may want to do some further research to see whether you can confirm that you are right.

3. Choose the one or two pieces in which you find repetitions and/or changes easiest to hear. Make a written description of what you hear in the organization of the piece, along with anything you have read about its organization. You can use authentic terms from the tradition, terms from a more familiar tradition, or your own words. These are your personal notes, so don't be afraid to include guesses or to indicate how certain or uncertain you are. You may want to revisit this description as you work through the course, to see how your ability to hear organization in the music is improving.
4. Notice what type of repetitions and changes you hear. Are the repetitions long or short? Are they very consistent, or do they change a lot? Do they involve sequences or clusters of sounds? Are you hearing and describing repetitions and changes in the instruments used? In the flow and timing of musical events or in what types of events happen simultaneously? In the volume or wavelength of sounds? In lyrics sung or in visual clues provided by singers, instrumentalists, dancers, or other participants]? You may want to explore next the aspects of the music that are easiest for you to hear and notice in the unfamiliar music. Save for later aspects that you find difficult to notice, keep track of, or describe.
5. You may want to revisit these pieces after doing some of the other modules in this course, to see whether it has become easier for you to hear the way the music is organized. Be sure to include information in your notes that will help you remember and relocate the recordings.
6. If you find it difficult to notice repetitions or changes in any of the pieces, try to find a shorter or simpler piece in the tradition. Video recordings may also provide extra clues to the way a piece is organized.

Use Organization to Join In

Choose a favorite audio example that has become very familiar. Choose any method of participation that you find comfortable and easy, for example:

- singing or humming along
- making simple movements (such as swaying, stepping, nodding your head, or tapping your foot) in response to the music

- dancing to the music
- using "conducting" gestures to indicate the beginnings of repetitions
- using **body percussion**, such as clapping your hands, snapping your fingers, stomping your feet, or slapping your thighs, to audibly add to the music
- using **found percussion**, such as hitting the bottom of a pot with a spoon, or tapping a pencil on the top of a table, to audibly add to the music
- using **home-made percussion**, such as a set of drums made out of wooden boxes or plastic tubs, to audibly add to the music
- using a familiar instrument to audibly add to the music

Listen to the piece again, while trying to join in with any of these methods to responding to, and actively participate in, the organization of the music. This might include, for example:

- Doing the same thing every time you hear a particular sound or sequence.
- Doing one thing during one section of the music (such as a verse) and something different when the music changes to a different section (such as a chorus).
- "Playing along" with any repetition that you find highly predictable, such as a steady beat.
- Changing what you do to reflect changes in what you hear. For example, you might clap louder when the music gets louder, or raise your hands higher when a sequence sounds higher.
- If you are leading a group of children in this activity, the responses can include silly or fun gestures or sounds (as long as it does not feel like you are making fun of the music tradition). You can also turn this into a listening game, with friendly competition to see who can hear and respond quickest to a repetition or invent a method of joining in that others like.

Your participation can be simple or complex, depending on your own comfort level. Assess for yourself:

- Are you participating in the organization of the piece? In other words, when the music changes, does what you are doing change? Are you

repeating what you do with the same timing that is used to create repetitions in the music?
- Do you find what you are doing musically satisfying? Does it sound and feel to you as if it “belongs” with the music that you are hearing and is organized along similar lines?
- To what extent does your participation reflect your own music traditions? To what extent is it appropriate or authentic to the tradition you are studying?

Try different methods of joining in, until you have found one or two that are relatively comfortable, easy, or fun for you. If you are satisfied with your ability to join in, you may want to try a more complex or challenging type of participation. If you find it difficult to participate to your own satisfaction, you may want to try a different type of participation, or try a different piece. If you found it pleasant to actively respond to the organization of the piece, or if you found it useful for understanding how the piece is organized, remember in the future to use this type of participation to help you “get into” unfamiliar pieces.

Play with unfamiliar methods of organization

- Choose any authentic instruments, familiar instruments, or virtual instruments that you are comfortable using for these activities.
- If you like to sing or play music, choose a familiar piece and try to reorganize it so that you are singing or playing it using the unfamiliar tradition's rules for repetitions and changes. For example, if you are trying to learn about jazz traditions, you could take a familiar piece and try to perform it using a standard jazz form that includes an improvised section.
- If you like to compose or arrange music, create a piece that follows at least some of the organizational structures and rules of the unfamiliar tradition. You may want to use the structure of a piece that you studied as a template. You can make any, or every, other aspect of the piece follow more familiar traditions. For example, if you are familiar with Hindustani music and trying to learn about classical Western forms, you can use familiar ragas, talas, and instruments to create a piece that is organized in AABA form.

- If you like to work with digital audio workstations, use clips of recordings to create a piece organized similarly to the pieces you have been studying and listening to. You can use clips from any music tradition you like.

Connecting Organization to Other Aspects of Music

The ways a tradition organizes its music naturally involves all other aspects of the tradition. If you have found specific concepts, aspects, or modes of organization that interest you, they may suggest ties to other aspects of music that you might want to follow up on, for example:

- The ways music is organized are typically closely tied to the flow of time. For example, in many south Asian and middle eastern traditions the raga of a piece is a basic concept that affects the way pieces are organized, over both shorter and longer time scales.
- The ways that pieces are organized is often tied to the ways they are remembered and passed on to others. For example, written versions of music often include visual indications of its organization.
- An organization concept may affect simultaneity choices. For example, in typical jazz forms, a repeated background (the “changes”) is supposed to be played at the same time as a set melody in some sections, but at the same time as an improvised melody in other sections.
- An organization concept may be strongly tied to participation in the music. For example, forms (such as masses or marches) that are tied to public rites, ceremonies, or celebrations may feature rules and traditions regarding “who does what” at various points in the music.
- An organization concept may influence the choice of instruments. For example, many musical traditions include rules that organize pieces into sections featuring voice and sections with no vocal part.
- An organization concept may be tied to the volume aspect of music. For example, in many popular song traditions, the refrain is typically louder than the verses.
- An organization concept may be strongly tied to the wavelength aspect of the music. For example, in many Balinese gamelan traditions, a

major aspect of form is indicated by long-term repetitions in the lowest-sounding instruments, a series of large gongs.

Exploring Music Theories: Remembering the Music and Passing it On
The methods that are used to remember and pass on the music of a particular tradition can provide insights into the theories, concepts, and terms that help insiders discuss and understand that music. Adopting the insiders' methods can help newcomers remember the music that they are studying and what they have learned about it, but outsiders can also remember what they have heard and learned using methods from more familiar music traditions, or even their own informal methods of notating or remembering the music.

Note: This module is part of Exploring Music Theories, a learning by doing course intended to help you explore the theories of music traditions that are not very familiar to you, or to compare different music theories to each other, or to explore music theory itself as an idea. It is a short experimental course that will be refined and expanded if there is sufficient user interest and feedback.

Introduction: Remembering the music and passing it on

Every group that makes music (and ethnomusicologists have found that this includes pretty much everyone) has developed some way to remember their music and pass it down through generations of insiders. There are many ways to do this. Vocalists may memorize how to sing, and instrumentalists memorize how to play, specific pieces. They may teach by rote what they have memorized, or new musicians may learn and memorize the pieces simply by watching and listening. They might develop a way to write down, or **notate** their music. They also may develop a **theory of their music that helps them remember** how to play it correctly; for example, concepts regarding the way the music is organized can help a performing musician remember what happens next.

For obvious reasons, the methods used to remember and pass on the music are deeply connected to what is remembered and how it is reproduced. For example, some kinds of music are meant to be remembered and recreated

the same way each time. In these traditions, written music is particularly helpful, and many musicians concentrate on learning to read music rather than learning the rules for creating it. Other kinds of music are meant to be **improvised**, so that each performance is expected to be somewhat unique. In these traditions, it is less useful to write the music down, and more helpful to ensure that musicians understand and remember the rules for how to create a good piece.

For this course, there is a separate question regarding what type of information you need and want to understand and remember. Are you hoping to be able to participate in this music somewhat authentically as a singer, instrumentalist, or dancer? Are you interested in experimenting with it on your own as a singer, instrumentalist, or dancer, or will you be satisfied to understand the music as a listener and audience member? In any of these cases, as you listen to the music of an unfamiliar tradition, you may at some point find that you want something other than the simple memory of the music itself to help you think about, understand, and remember pieces. However, the extent and types of notes you want to take will depend on what, and why, you want to understand and remember.

Depending on what you want to learn and remember, you may find any of the following useful:

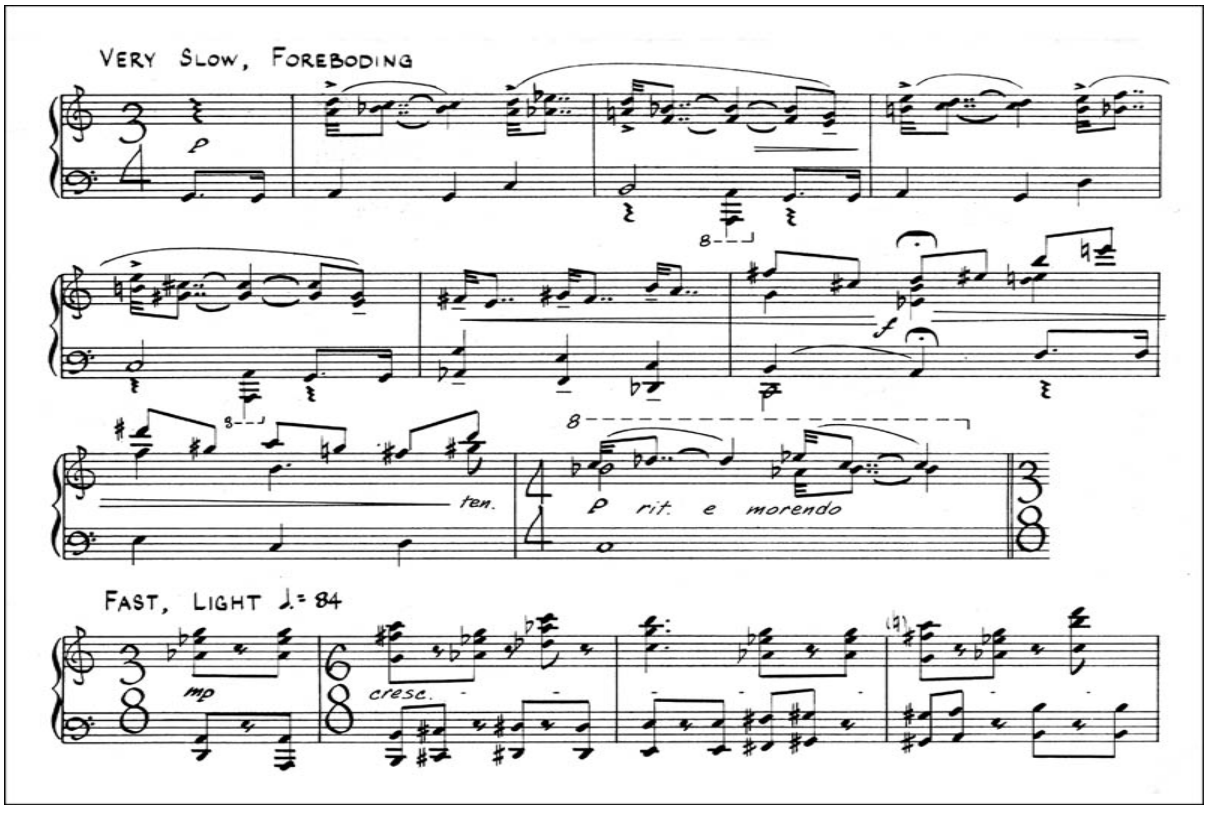
- theory, terms, and concepts
- written music
- recordings
- visual representations of the sounds

One of the reasons for learning a little bit of music **theory, terms, and concepts** is that the it can help you understand and remember what you hear. Terms and concepts may give you an idea of what to listen for in the music. Some terms will be easier for you to grasp as a listener, while others may be difficult to explore without an instrument. For example, knowing that the organization of a song includes verses and refrains can help a listener divide the song into memorizable chunks, and then recall what order to sing them in. On the other hand, most people find it difficult to remember the wavelength of a musical sound without playing it on some sort of instrument.

To decide what aspects of a theory you want to learn, you may want to begin by thinking about what you most want to know or understand about the music. This may help you decide how to remember what you learn about it and hear in it. For example, you may want to keep notes on some of the following as you explore an unfamiliar music tradition:

- the terms you find that are relevant to the unfamiliar music, along with any terms from your own tradition that you find useful or relevant
- their meanings as explained by others and guessed by yourself
- the examples of each concept that you have found within explanations, or heard for yourself in the music
- the names of favorite musicians and pieces, along with information about how and where to find your favorite recordings and examples
- the places where you found useful information, explanations, recordings, notated music, diagrams, ideas, and examples
- any guesses you make about what terms and concepts mean, as well as questions, confusions, and uncertainties you still have.

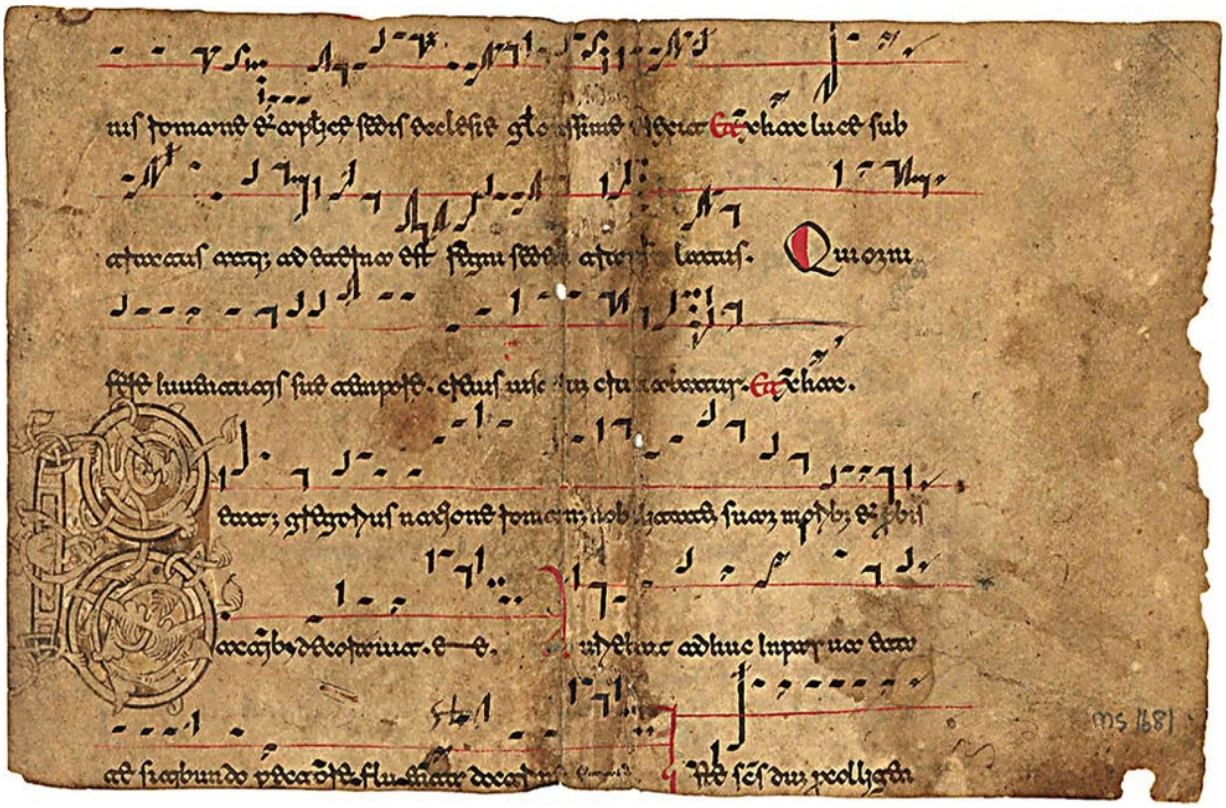
Common Notation



"Common" or "standard" notation is now widely used, in part because it features ways of visualizing, remembering and passing on a large amount of information about each individual sound. The trade-off for including all of this information is that it is challenging to learn to read fluently. Many other notations include less information and are consequently easier to learn to read.

Many traditions include some way of symbolizing, in writing, the musical sounds themselves, so that specific pieces can be saved and “read” whenever they need to be remembered or passed on. **Written music** is most commonly used in traditions (such as Western classical) in which long pieces of music are meant to be played the same way each time. Common notation is what most people picture when they think of written music (see [link]). However, many traditions in which the music is usually performed from memory or improvised have also developed a variety of ways to write down music. Many of these are easier to learn than common notation and may be more useful with certain types of music. You may find it very useful to learn the method of writing music that is most relevant to the tradition you want to study, or you may prefer to use a method you already know. You may even find it easiest to make up your own set of **symbols that represent what you hear in the music**.

Medieval European Manuscript

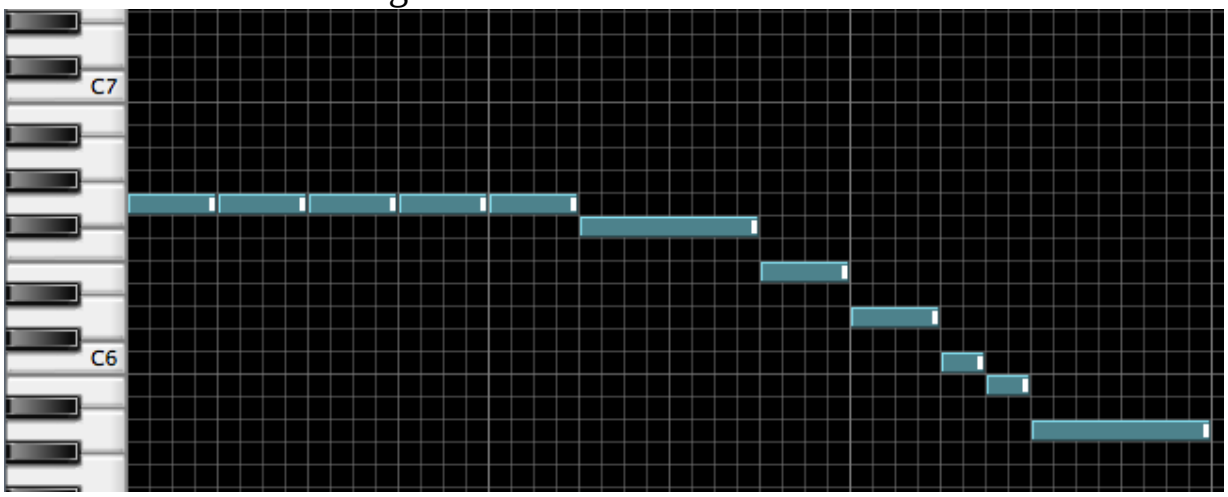


A variety of different ways to write down music have been invented. Many are still in use in various music traditions - including widely popular modern genres - because they reflect the ways that the musicians understand and discuss their music.

Music **recordings**, either audio only or audio-video, are also obvious aids to remembering music and passing it on to others. In comparison with the entire history of music, recording is a relatively recent phenomenon, so the ways that various groups of musicians are using audio recording as ways to remember and pass on music are still evolving. In some more conservative music traditions, modern recording methods are still not used for much except to preserve and sell performances to listeners. In faster-evolving traditions, such as rap, recordings have themselves become part of the practice of creating and participating in the music. At the least, you will almost certainly want to keep notes that help you find and keep track of favorite recordings of music in the unfamiliar tradition. If you have the tools needed, you may also want to extract specific pieces of recordings for

your notes, for example when they demonstrate a concept that you are studying, or when you are trying to decide what is happening at that point in the music.

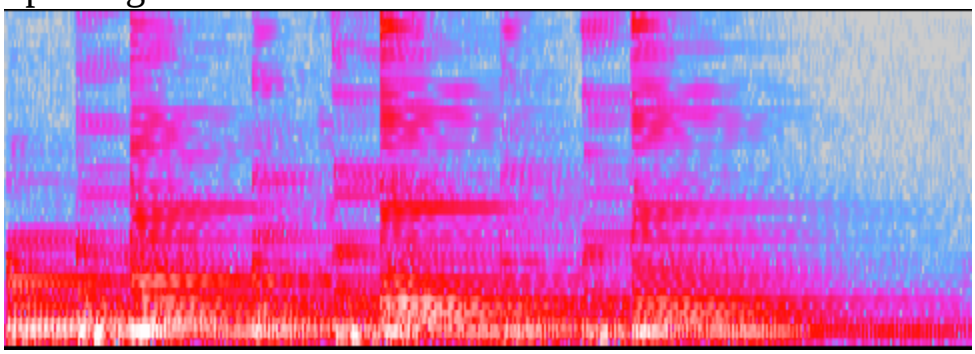
Piano Roll View of a Digital Audio Workstation



New ways of making music, such as digital audio workstations, also provide new ways of remembering the music, both as sound and as visual symbols.

Like audio recordings, **visual representations** of the sounds themselves have become much easier to obtain with new technologies. Using a digital audio work station or other technologies, or pictures or videos created by other people, you may be able to find or make spectrogram, waveform, piano roll, or other types of “pictures” that help you “see” what is going on in the music.

Spectrogram



Visual representations of the sound itself, such as spectrograms, can also be used to study, understand, and remember the music.

Research ways that the music is remembered

Search within discussions of the tradition for **terms that are related to ways of remembering or passing on the music**, particularly the ways that the following are used in the tradition:

- terms that are used to recall, or to remind students, what to play
- mnemonic devices used to organize and remember concepts or performance practices
- written music
- diagrams, pictures, symbols, and other visual representations
- audio and video recordings

For example, Western classical music relies on a type of written music called **common notation** or **standard notation** to teach novice musicians, as well as to remind professionals how to play very long and complex pieces. However, less formal common practice traditions, such as rock and pop, rely more on recordings for learning and on written **chord symbols** to remember what to play.

You may also want to research the **cultural aspects of remembering and passing on the tradition**, which can also give you insights about how to listen to and understand the music. For example:

- How are the traditions of making the music passed on to new generations of insiders (for example, formal lessons vs. self-teaching)?
- Are particular people formally considered the official preservers of the tradition?
- Do insiders consider some ways of preserving and passing on their music more authentic than others (for example, recordings vs. written music vs. live performances)?

- How do insiders go about describing or explaining their music to outsiders? Are some aspects of it considered too sacred or too complex to be shared with outsiders?
- What reasons do insiders give to explain or justify these various attitudes?

Once you have discovered the main ways the tradition gets remembered and passed on, learning the **terms that apply to their method-of-remembering** may also help you uncover and understand important theory concepts. For example, discussions of classical Western genres are likely to feature terms that are related to the written music. Discussions of rap genres, on the other hand, feature recording terminology, since audio recordings are important, not only for remembering the music and passing it on, but also for constructing it.

Develop your own ways to remember, think about, and discuss the music

You will want to **develop your own preferred methods** of remembering the music you are studying and what you have learned about it. You may also want to keep track of the progress you are making as you answer the questions that intrigue you, learn to do the things you would like to be able to do, and develop higher-level questions and goals. Your methods of remembering and keeping track may be any combination of written words and diagrams, recordings, methods borrowed from the authentic traditions of that music, methods from the music traditions that are more familiar to you, and methods that you invent for yourself. Your methods are likely to evolve as you learn more, but the following activities should help you discover what is easiest and most useful for you right now.

In the activities suggested below, you will get a chance to practice using various methods to accurately remember and think about pieces that you would like to study. The more methods you have to remember different aspects of the piece, the easier it will be for you to learn, remember, and understand more about it over time. As you research, try to find several different methods that you think might be useful to you; then try the different methods in the activities, to see which ones are actually most

useful. There is a learning curve associated with any method for remembering music, that is separate from learning about the music itself. You may find it very useful to learn or develop a favorite "remembering" method slowly, piece by piece, while you are also learning about the music. Meanwhile, don't be afraid to adapt any of these methods to make them most useful for your personal notes.

Categories of Methods to Try

- If you have had any **training within a particular music tradition**, remind yourself of the ways you have already been taught to remember, write down, read, or take notes about, music. If you need to, search for information that refreshes your memory of how these methods work. Decide which ones you like, and which ones you think might be useful for exploring an unfamiliar tradition.
- If you have had no training or experience as a musician, even within the traditions most familiar to you, **search for information on the ways that familiar music traditions write down, symbolize, or take notes about, music**. You may find that there are aspects of these practices that seem familiar or that make sense to you, and that you could adapt for your purposes. For now, don't worry about whether you are using them correctly; you will only be using them for your personal notes, so it does not matter.
- Also **search for information about how music is remembered and passed on in the unfamiliar tradition that interests you**. Read about it and look at examples if at all possible. You may find that there are aspects of these methods that seem to make sense to you and that you might find useful for remembering and thinking about the music. Again, don't worry for now about whether you are using them correctly; you will only be using them for your personal notes, so it does not matter. But do remember that it is possible that you are not using the methods in an authentic way; as you learn more about the tradition, you may find that you can change or expand your use of their methods to make better notes for yourself as well as better understanding what the written notes, symbols, and terms mean to insiders.
- Search for **ways that you might be able to use audio or video recordings** to remember, keep track of, and study pieces. This includes

not only ways to listen to specific sections of a piece repeatedly, but also ways of looking at representations of the sound, such as wave forms or spectrograms. (For example, you can search for ways to use a spectrogram to transcribe music or to name or identify the sounds that you are hearing.)

- If you can already use a MIDI instrument, digital audio workstation, or other computer-based or internet-based tools to create music, you may be able to use this ability to create a version of the piece that you can use to play back sections of the piece, identify or experiment with characteristics such as the timing and wavelength of sounds, or create helpful visuals such as spectrograms or piano-roll views. If you are not familiar with these types of tools, you may want to **search for a computer-based music-recording or music-creation tool** that is easy for you to learn to use. There are large numbers of commercial programs for this, but there are also free and open tools such as Audacity, LMMS, and various websites that offer free tools for exploring sounds.
- See whether or not you can find **the words or lyrics** of pieces in the tradition that interests you. You may be able to use these to help you remember and keep track of the music. Similarly, any **descriptions of the forms of the pieces or of things that happen during the piece** may also help you keep track of what is going on the music.
- Finally, you may want to **experiment with your own made-up ways to write down and remember** the aspects of the music, or test your ability to **accurately remember aspects of the music by ear**, using simple notes or descriptions as reminders.

Use your preferred methods to listen to, remember, and discuss the music

1. Choose two or three favorite pieces in the tradition that you would like to learn about.
2. Search for any records of the pieces that have been made by insiders and that you can refer to repeatedly. This might include, for example: audio recordings, video recordings, written music, written lyrics, discussion or analysis of the piece, diagrams representing it, or spectrograms of it.

3. Once you have gathered and developed the records that you can of each piece, choose a short section of each piece that you find interesting. Using an audio or video recording of each piece, listen to these specific sections several times, with the aim of being able to remember it, think about it, and discuss it. Can you figure out a way to easily listen only to that section repeatedly?
4. Choose 2-4 other methods for trying to remember the piece, that you think are available to you based on any written records you have found or are able to create for yourself (written music, lyrics, discussion, analysis, diagrams, spectrogtrams, etc.). Use these methods to create your own notes about the sections of the pieces that you have been listening to.
5. Wait for a while (at least a few hours, and preferably at least one day). Without looking at your notes, try recalling the section of the piece. If possible, try describing it to a friend, family member, or fellow musician. Or describe it aloud to yourself, or make a fresh set of notes about it from memory. What musical events or aspects of it can you remember and describe?
6. Now refer to your written notes and records, and repeat your attempts at describing the piece. Which notes and records helped you remember and describe it better? Are there aspects of the music that are important to you that you still cannot remember? If so, how might you change your methods to include them?
7. Finally, listen carefully to each section again. Can you still find it easily? Did your notes help you remember the sounds accurately? If not, how might you change your methods to help you remember the piece more accurately?

Use your remembering strategies to join in with the music

1. Of the pieces you studied in the previous section, choose the one for which you have been most successful in finding or creating many different types of records.
2. Choose a method of joining in with the music in a way that demonstrates that you remember something about it. For example, you might sing along with the lyrics, or join in playing or “conducting” repeated sounds or events in the flow of time of the music. (Do not

choose participation methods that you can do without remembering anything, such as clapping or swaying to a sound that happens with very regular, predictable timing.)
3. Try your joining method with each of the audio records you have of the piece. This includes any audio recordings, video recordings, and playable music files. Do any of the records seem to make it easier to remember and join in?
4. Choose a favorite audio record. Look at your written records of the piece while joining in with audio record. Do any of your written records help you remember and anticipate when and how to join in?

Use your remembering strategies to play the music for yourself

1. Of the pieces you have been studying, choose the one that feels most familiar.
2. Choose a part, or event, or aspect of the piece that feels most comfortable and familiar.
3. Choose a time when you have not listened to the piece for a while.
4. Try to recreate the part (or event or aspect) for yourself. You can do this on a familiar musical instrument, with voice, body, percussion, found percussion, or home-made percussion, on an instrument authentic to the tradition, or with computer-based tools and programs.
5. Refer to any written records you have of the piece. Do any of them help you recall the part (or event or aspect) better? Can you revise your performance to make it better, based on the written records?
6. Refer to any recordings or sound-based records you have of the piece. How easy is it to find the part (or event or aspect) and use it to help you perform it more accurately? Is playing along with the record helpful, frustrating, or distracting?

Connect remembering to other aspects of music

The ways a tradition remembers its music naturally involve all the other aspects of the music. If you have found specific concepts, aspects, or modes of remembering that interest you, they may suggest ties to other aspects of music that you might want to follow up on, for example:

- The ways that pieces are organized is often tied to the ways they are remembered and passed on to others. For example, written versions of music often include visual indications of its organization.
- The ways music is remembered may depend on the instruments that are played. For example, in many traditions that do not use written music, instrumentalists may be expected to remember, and pass on, what their own instrument should play in each piece.
- The ways that music is remembered may be strongly tied to participation in the music. For example, music is most likely to be remembered and passed on by the entire community of insiders if everyone is expected to participate in it (for example, by singing the words).
- The ways that music is remembered may be tied to the volume aspect of music. For example, louder parts may be remembered longer and more accurately by more insiders than quieter parts.
- The ways music is remembered are likely to depend strongly on the flow of time. For example, sounds that repeat in time in a regular pattern may be remembered in terms of the pattern, rather than as individual sounds.
- The ways that music is remembered may be strongly tied to the wavelength aspect of the music. For example, limiting the number of different wavelengths that are used in a piece tends to make it much easier to remember.
- The ways that music is remembered is tied to issues of simultaneity. For example, in music traditions in which different parts develop in different ways over the same time, listeners may accurately remember only the most obvious, loudest, or easiest-to-understand part.

Exploring Music Theories: Instruments
Learning about the instruments that are used in a music tradition (including voice), the techniques used to play them, and the concepts and terms that the instrumentalists use to discuss what they do, can provide insights into understanding the music itself. Outsiders to the tradition may find that the instrumental tradition is a particularly accessible place to begin studying an unfamiliar music tradition.

Note: This module is part of Exploring Music Theories, a learning by doing course intended to help you explore the theories of music traditions that are not very familiar to you, or to compare different music theories to each other, or to explore music theory itself as an idea. It is a short experimental course that will be refined and expanded if there is sufficient user interest and feedback.

Introduction: The instruments that make the music

In this course, the term **instrument** is used loosely and informally to include anything that is used to make the sounds in a piece of music. This may include:

- the voice and any other ways that the body is used to make musical sounds (for example, hands clapping)
- objects that are created specifically in order to make music (for example, gongs, xylophones, guitars, sitars, pianos, and accordions)
- objects that were created for some other purpose but are sometimes used to make music (for example, spoons, washboards, bows, and found percussion)
- electric, electronic, and “virtual” musical instruments, as well as any digital hardware and software (such as digital audio workstations) that are used to create sounds used in the music

Given this open definition, instruments are clearly part of every piece of music, but the instruments used in one piece may be completely different

than the instruments used in another. In fact, some of the most obvious differences between various music traditions involve:

- which instruments are most commonly used
- which instruments are considered most traditional or authentic
- which instruments are not permitted, or are considered too far outside the tradition to be used
- the participation roles in which each instrument is typically used, or allowed to be used
- the ways that each instrument contributes to specific aspects of the music, such as wavelength, volume, flow of time, and simultaneity.

Instruments may also be one of the easiest points for outsiders to begin recognizing and understanding a musical tradition.

Most music traditions include a set of instruments that are considered particularly authentic or appropriate for that music.

Research the instruments

As you research the music tradition that interests you, make sure you keep notes that will help you remember what you have found and where you found it. In particular, you may want to be able to easily find favorite pictures of instruments and instrument groups, and favorite audio or video examples that demonstrate what an instrument (or group) sounds like, and how it is played.

Look for **terms that name the types of instruments** that are most common and authentic, both in your language and in the language(s) of the groups that are insiders to the tradition.

Look for **terms that are used to classify instruments**. For example, common practice traditions tend to classify instruments according to the way the sound waves are created, using terms such as:

- strings
- brass
- reeds
- percussion (i.e. instruments that are hit)
- electric

Look for **terms that name groups of instruments** that typically play together. For example, terms that are used to identify instrument groups that play Western classical music include:

- band
- orchestra
- quartet
- quintet
- ensemble

As you learn about standard instrument groupings, **make sure that you know what each term means within the tradition that you are studying**.

For example, the instrumentation of a “band” that plays classical music or marches is completely different from a “band” that plays rock or pop music. A “quintet” that plays jazz also will have a different instrumentation from one that plays classical music. Some terms describe a very specific instrumentation. For example, a “string quarter” nearly always comprises two violins, a viola, and a cello. Other terms may be more or less general. For example, **ensemble** is a very general term that the Western classical tradition uses to refer to any group of instruments that plays together. An orchestra, on the other hand, is always a large and varied group of instruments, although some are larger and more varied than others.

Specific musical instruments can become deeply associated with other aspects of a culture, including religion, ethnicity, and nationality.

You may also want to research **the cultural meanings of the various instruments** for the insiders to that music tradition. For example:

- Do any specific instruments or groupings of instruments seem to function as the “national instrument” of a particular country?
- Are any of them strongly associated with a particular ethnicity, caste, or social status?
- Are any of them strongly associated with a much-loved custom, such as a favorite holiday?
- Are any of them strongly associated with a particular religion?
- Are any of them strongly associated with a famous person or famous group of people? (This could include musicians who have achieved a "national hero" status, as well as people who became famous for some reason other than their music.)
- Are there connections between musical instruments and other arts and crafts of a particular group? For example, are instruments decorated using traditional visual arts (such as painting) or crafts (such as woodworking)?

It is not uncommon for musical instruments to become deeply integrated with other arts, including architecture, design, crafts, sculpture, drawing, and painting. The instruments themselves may be considered visual works of art as well as sound-making instruments.

You may also find that learning **the most common terms for parts of the instruments, for different types of the same instrument, or for methods of playing the instrument** helps you follow discussion of other aspects of the theory. For example, knowing something about the ways the voice may be used in Carnatic music might help you understand discussions of ragas. Or knowing something about the parts of a guitar, and the ways it is played, may help you understand discussions of wavelength, as well as discussions of the participation roles of the bass guitarist, rhythm guitarist, and lead guitarist in a rock band.

Listen for instruments in the music

- If you have any video recordings from the tradition, watch one or two of them. (If you cannot find any videos, you can try to do this exercise based only on still pictures of instruments in the tradition and your best guesses as to what each instrument might sound like. However, this approach will probably be more difficult.)
- Take note of the instruments you see. Name them if possible; do some further research if necessary.
- Watch and listen carefully to try to connect each instrument you see with the sounds it makes.
- Now choose an audio recording of a different piece from the same tradition. If possible, begin with a recording by the same performer(s) as the video, or any recording that you feel is likely to have a similar set of instruments.
- Listen to the audio recording, noting the instruments you hear that are the same as those on the video recording. Listen for any other instruments you hear. Can you guess what they might be, based on your research into the common and authentic instruments of the tradition? You may want to do some further research at this point, listening to recordings of specific instruments in the tradition and comparing their sounds to the sounds that you hear in the piece.
- After making your guesses, research the recording to see whether you can discover a list of the instruments played, to confirm or refine your guesses. You may want to listen to the recording again, with the list of instruments at hand, to see whether you can identify each instrument on the list when you hear it played.
- Repeat this exercise with as many different recordings as you like, until you are relatively confident of your ability to recognize by ear the instruments used in this music tradition.

Join in with an instrument

- Choose a favorite recording in the tradition. Choose a short section of the recording that has become relatively familiar and is easy for you to find and play back repeatedly. (You may want to turn it into a loop if you have the capability to do so.)
- Choose a particular aspect, event, or line in this section that you can recognize easily and believe you can reproduce. What instrument do

you believe is producing that aspect, event, or line in the recording?

- Play the section of the recording, while trying to join in with that aspect, event, or line using your voice or body percussion (such as clapping hands, snapping fingers, stomping feet). Which are easiest for you while creating a satisfying addition to the sound of the music?
- Play the section of the recording again, while trying to join in with that aspect, event, or line with “found percussion.” Experiment with any objects that you can obtain easily, such as kitchen utensils, table tops, and various types of containers. Again, which are easiest for you while creating a satisfying addition to the sound of the music?
- Play the section of the recording again, while trying to join in with that aspect, event, or line with any instrument you have available from your own music tradition. (Skip this step if you do not play any instrument. If it makes sense to do so, you can switch to a different aspect, line, event, or section of the music, or even a different recording, that is better suited to an instrument you play. Which instrument do you believe is playing this new aspect, line, or event?) Are there any familiar instruments that you can use to create a satisfying addition to the sounds from this tradition?
- If you can play a familiar instrument with the recording, but the result is not satisfactory, what seems to be causing the incongruity? It might be differences in tuning or in ornamenting the melody, for example, or timbres that don't blend, or a technical difficulty in "keeping up" with the music. Spend some time experimenting to see whether you can make the familiar instrument "work" better within the tradition (for example, by retuning it, using a mute, practicing the piece on your own, or even trying to play along with a different recording). You may find that an ability to "play along" in the tradition using a familiar instrument can help you study and understand other aspects of the tradition, such as wavelength and participation.
- Play the section of the recording again, while trying to join in with that aspect, event, or line with any instrument you have available that is authentic to the tradition. (If it makes sense to do so, you can switch to a different aspect, line, event, or section of the music, or even a different recording. Which instrument do you believe is playing this new aspect, line, or event? Is it the same type of instrument as the one you are playing?) Can you play the instrument well enough to create a

satisfying addition to the sound of the music, even if you are only playing a simplified version of the music? If you can play any instrument that is authentic to the tradition, even only at a novice level, that should help you explore the other aspects of the music, such as wavelength and participation.
- If you enjoy making your own instruments, you may want to experiment with building an instrument of your own that has some of the capabilities of the authentic instruments that play the lines and events that attract you. This may become a long-term project that includes research into how the instruments produce various aspects of the authentic sound.
- If you enjoy working with electric or computer-based instruments, you may want to experiment with ways to create for yourself an electric or virtual instrument that mimics aspects of the authentic sound that attract you. This may become a long-term project that includes research into various aspects of the authentic sound, such as timbre and wavelength.

Play on an instrument

- Try to reproduce the aspect, event, or line that you joined in with, in the activities above, but without playing the recording.
- Experiment with all instruments that you found useful and satisfying for playing along with the recording, including voice, body percussion, found percussion, familiar instruments, authentic instruments, constructed instruments, and virtual instruments.
- Which instruments allow you to reproduce independently a satisfying version of that aspect, event, or line in the music? If none do, you may want to skip the “play” activities in this course, or you may prefer to try to improve your abilities on one or more of the instruments. Practicing by playing along with the recordings may help you improve on your own, or you may want to get help from a more experienced musician or music teacher.
- If you are comfortable working with digital audio, you may find that working with virtual instruments is a particularly useful way to "play" in an unfamiliar music tradition, because you can take your time to construct your independent version of the piece, and you may also

have access to extra information, such as the wavelengths of the sounds you are using. If you have already created an electronic part for the piece in the activities above, you may want to challenge yourself to add more instruments to create a more complete personal version of the music.

Connect the instruments to other aspects of the music

The sounds that instruments make naturally involve all other aspects of the tradition. If you have found specific aspects of instruments that interest you, they may suggest ties to other aspects of music that you might want to follow up on, for example:

- An organization concept may influence the choice of instruments. For example, many musical traditions include rules that organize pieces into sections featuring voice and sections with no vocal part.
- The ways music is remembered may depend on the instruments that are played. For example, in many traditions that do not use written music, instrumentalists may be expected to remember, and pass on, what their own instrument should play in each piece.
- Participation in the music is strongly tied to instruments. For example, in many traditions, leading the music is a role reserved for the player of a particular instrument.
- Volume is also closely tied to instruments. For example, many instruments must be played loudly (or quietly) in order to create the sounds considered appropriate for the tradition.
- Issues of flow of time are also tied to the ways instruments are played. For example, some instruments can play many sounds in very quick succession, while others cannot.
- Wavelength is also strongly tied to the ways that instruments are played. For example, most instruments can only make their characteristic sounds within a limited range of wavelengths.
- The ways that instruments are played also create simultaneity issues. For example, some instruments can easily play multiple sounds at the same time, while others can only play one musical sound at a time.

Exploring Music Theories: Participation

The concepts and terms that insiders use to understand and discuss a music tradition influence, and are influenced by, the roles that various people play in an authentic musical performance within the tradition. This aspect of a music tradition can offer outsiders a relatively accessible point of entry into the related music theory.

Note: This module is part of Exploring Music Theories, a learning by doing course intended to help you explore the theories of music traditions that are not very familiar to you, or to compare different music theories to each other, or to explore music theory itself as an idea. It is a short experimental course that will be refined and expanded if there is sufficient user interest and feedback.

Introduction: Participating in Music

Music always involves people making and experiencing sounds. Each music tradition includes expectations about how the activities of making and experiencing the sounds are divided among the people involved. In some traditions, these expectations include strict divisions of tasks, with certain activities reserved for formally-recognized roles. For example, the task of setting the pace of the music may be reserved for a formally designated music leader, and dancing to the music may be reserved for performers specially trained in the correct dance style. Other traditions are less formal, with roles and activities taken on by anyone who feels capable of doing them. For example, the pace of the music may be set informally, by agreement among a small group of instrumentalists, and anyone who wishes to dance to the music may feel free to do so. In all traditions, there are expected “activities” for everyone, including those whose roles are passive or not centered on music-making. For example, listeners might be expected to sit and listen attentively, to express their appreciation in specific ways and at specific times, or to undertake other activities (such as taking part in religious rites or mingling at a party) while the music plays in the background.

People may adopt various roles in a musical performance, such as instrumentalist, singer, dancer, leader, or audience member. Part of any music tradition includes the expectations for each role, including how one should dress and act, and where to stand or sit, as well as the sounds one should or should not make.

Learning what is expected of each role may also help you understand the meanings of the music for those who participate in it, and perhaps help you identify active roles in the music that you might be capable of taking on eventually. It may also increase your comfort level in attending live performances of the music and your ability to participate in them in an authentic manner. Studying recordings privately can be more comfortable and feasible than attending live performances, but the latter provide opportunities for noticing and learning things that simply are not available with even the highest quality video recordings.

Research the participation activities of the tradition

As you research the music tradition that interests you, make sure you keep notes that will help you remember what you have found and where you found it. In particular, you may want to be able to refer back to favorite videos that clearly show the ways that people are participating in the music, and the ways that the participation is divided among different roles.

Search for **terms that name or describe the roles taken on by the people who are making or experiencing the music**. The meaning of some of the terms may be obvious to you, while others may require a definition or explanation. Here is a list of some of the types of roles to search for, with examples from common-practice traditions:

- Creative roles (for example, composer, arranger, improviser, or producer)
- Leadership roles (conductor, first chair, section leader, drum major)
- Instrument-playing roles (organist, drummer, trumpet player, soloist, rhythm section)
- Vocal roles (rapper, tenor soloist, alto section, choir member)
- Dancing roles (ballerina, folk dancer, mosh pit)
- Logistics and management roles (roadie, publisher, technician)
- Listening roles (judge, critic, audience member)

Search for **terms that name or describe the activities associated with the main roles, or the roles that you find most interesting**. Again, some of these may be obvious, while others are surprising. Don't assume that the activities undertaken will be the same as those in a more familiar tradition. For example, in some traditions, the activity “deciding the pace of the music” is typically done by a designated leader. In others, it is done by the player of a particular type of drum, or by the lead dancer or an instrumental soloist. Here is a list of some of the types of activities to search for, with examples from common-practice traditions:

- Who does which activities before and after a musical event? (for example, deciding the time and place, advertising the event, setting up and putting away equipment)

- Who does which activities that produce musical sounds? (playing an instrument, singing, clapping to the beat)
- Who does activities that coordinate the efforts of the musicians? (composing, conducting)
- Who does non-musical activities that are associated with performing this type of music? (performing ceremonies, serving food)
- Who does which activities that respond to the music? (listening attentively, applauding at appropriate times, recording, writing reviews)

Once you have a list of roles and activities that are common in the tradition, search for **clues as to who may take on each role or activity**. For example:

- Is the activity/role officially or formally reserved for an expert? If so, what type of credentials are required to prove expertise? Is it officially reserved for a community or religious leader? Is it officially reserved for someone who is a guest-of-honor participant (for example, the bride in a ceremony that includes music)?
- Is the activity/role informally reserved for someone with much practical experience with this type of music, or for someone who "usually" takes that musical role in the community, or for a community leader or guest of honor?
- Is the activity/role considered to require the full attention of the person who takes it, or might that person take on other roles or activities? (For examples, might a dancer also play a musical instrument, or do dancing roles preclude any other type of participation?)
- If the activity/role can be combined with other activities or roles, can they be done simultaneously by the same person, or must they be done at different times? (For example, the player of a drum set in a jazz band may play drums and cymbals at the same time, but a percussionist playing drums and chimes in an orchestra walks back and forth between the two types of instruments, playing them at different times rather than simultaneously.
- If the activity/role can be combined with other activities or roles, what combinations are considered authentic or common? (For example, in Western orchestras, it is common for a drum player to also play

cymbals as needed, but it is not common for a flute player to also play cymbals as needed.)

Search for **terms that name or describe anything needed to do the main activities, or the activities that you find most interesting**. Some of these will be obvious, while others are less so. For example, a guitarist obviously needs a guitar. What may be just as necessary to guitarists in some traditions, but less obvious, are a pick, a neck strap, an amplifier, a source of electricity, and various connecting cords. Learning something about the equipment needed can give you insights into other aspects of the music, including its organization and musical meanings, how it is remembered and passed on, the instruments that are considered traditional or authentic, how its time flow is created and managed, and how desired sound volumes, wavelengths, and simultaneities are achieved. Here is a list of some categories of things to search for, with examples from common-practice traditions:

- Spaces with specific acoustic properties, such as reverberation
- Equipment needed to ensure that everyone in the space can hear what they need or want to hear (microphones, amplifiers, headsets, walls and ceilings that reflect sound)
- Equipment needed to ensure that everyone can see what they need or want to see (stages, risers, video equipment)
- Things that legitimize or reveal the meanings of the music (revered objects, opera sets, Christmas decorations)
- Appropriate clothing or costumes (band uniforms, opera costumes, audiences dressed for dancing)
- Equipment needed to make the appropriate sounds on an instrument (picks, bows, mutes)
- Objects needed to make it possible or comfortable to play the instruments (benches, stools, chairs, straps)
- Objects needed to recall a piece correctly (written music, music stands)

You may also want to research **the cultural roots and meanings of musical roles, activities, and the objects used**. Understanding how insiders view each role and activity can give you insights into which roles

are easiest for novices and which are considered to be acceptable when performed by outsiders. For example:

- Where do performances typically take place? Does the performance space have particular cultural associations, such as being a "public" space, or a space reserved for religious worship, or a space associated with a particular class or ethnicity?
- Are the people who take on specific roles or activities expected to dress in a certain way? What are the cultural meanings attached to the dress or costume?
- Are any musical roles or activities reserved for specific government, community, or religious officials?
- Are particular musical roles or activities considered the duties of specific members of society?
- Are any musical roles or activities associated with paid work as a professional musician or music teacher?
- Does taking on particular musical roles or activities command respect from other members of the culture? Conversely, are some musical roles or activities frowned upon or disrespected by some groups or members within the culture, or by members of another culture? (For example, Romany musicians in some cultures are valued as wedding musicians while being treated as lower-class citizens.)
- Are any of the objects associated with music-making treated with special respect or reverence?
- Are some roles or activities considered “more central” or “more important” to an acceptable performance of the music?
- Are some roles or activities traditionally given to novices? To visitors or outsiders?
- What are the reasons that insiders give to explain who is allowed or expected to take on each role or activity? Many of the reasons may ultimate be practical; playing chimes and drums simultaneously would require more than two hands. However, the reasons given may also have cultural roots.

Listen and watch for participation roles in the music

- If at all possible, watch a video recording of a live performance in the music tradition that interests you. If you can choose from multiple videos, choose one that shows many different people (not only the main music-makers). A video that includes commentary or explanations before, after, or during the performance may also be very helpful.
- Watch the video as many times as you need to, in order to focus on different people visible in the recording. Try to identify who is undertaking the various roles and activities that you have been reading about.
- If at all possible, attend a live performance in the music tradition that interests you, with a goal of identifying and watching the people filling the roles and activities that you have been reading about. Meanwhile, watch insiders who are taking more peripheral, passive, responsive, or quiet roles, and emulate their activities as much as is possible and appropriate. Watch the active music-makers, trying to identify their roles and activities in light of what you have learned about the tradition. If possible and appropriate, also watch the various people who take necessary or active roles that do not involve making the sounds, for example those who set up the equipment, perform rituals, or organize the flow of people.

Practice joining in with specific roles and activities

- Choose a favorite recording from the tradition you are studying.
- Choose any peripheral or responsive role that you are comfortable with, and that is authentic to the tradition (such as audience member or critic) and respond to the recording with the appropriate activities.
- Choose a more active role (such as singer, dancer, or instrumentalist) that interests you and is authentic to that tradition. As much as possible, join in while listening to the recording with the activities that are traditionally included in that role. You do not need to give a polished or authentic performance, only one that you feel is reasonably enjoyable and adequate for private study sessions.
- If needed, experiment with different roles, or practice one role multiple times until you have identified at least one role or activity that allows you to actively join in while listening to recordings in this tradition.

Take on participation roles

- If it is possible to attend multiple live performances of the music tradition, attend enough to take on as many different roles and activities as are comfortable and possible for you. For example, you may want to start by taking a passive observers role, moving gradually to a more active responsive role (for example, dancing to the music, discussing the performance with other attendees, or even writing reviews of the music for other outsiders), and finally to more central roles such as playing an instrument or organizing a time and place for a special performance.
- If it is not possible for you to attend live performances in the tradition in person, and you would still like to take an active, real-world role in this tradition, consider whether it is possible for you to undertake some of the peripheral activities at a distance from the actual performance. For example, are you interested in producing or distributing recordings of the music? Writing or teaching about that tradition from your perspective as an outsider? Arranging music from the unfamiliar tradition for musicians in your own tradition, or arranging music from your own tradition for musicians in the unfamiliar tradition? What is possible will depend on your capabilities and sustained efforts, and may also require interest and cooperation from musicians in the unfamiliar tradition.
- If it is not possible for you to take on roles and activities out in the real world, follow up on the most active roles that you developed while joining in with the recording. Are there any that you can reproduce reasonably well (such as a performance on an instrument) even without the recording?
- If you enjoy working with digital-music tools, you may want to challenge yourself to see which sound-creation activities you can mimic in a digital creation of your own. How many different ones can you combine, from which roles? In what ways does the resulting piece sound authentic or inauthentic to you? If possible, ask an insider to the tradition for constructive criticism regarding which aspects of your creation sound authentic or inauthentic.

Connect participation to other aspects of music

- Organization concepts may be strongly tied to participation in the music. For example, forms (such as masses or marches) that are tied to public rites, ceremonies, or celebrations may feature rules and traditions regarding “who does what” at various points in the music.
- The ways that music is remembered may be strongly tied to participation in the music. For example, music is most likely to be remembered and passed on by the entire community of insiders if everyone is expected to participate in it (for example, by singing the words)
- Participation in the music is strongly tied to instruments. For example, in many traditions, leading the music is a role reserved for the player of a particular instrument.
- Participation is also tied to the volume of music. For example, as a general rule, the more participants make sounds, the louder the volume of the music.
- The flow of time is also tied to participation in the music. For example, when the flow of time in the music is divided into predictable patterns (such as a regular “beat”), it is easier for large numbers of people to use that predictability to participate actively in the music (for example, by “clapping on the beat”) without causing chaos.
- Wavelength is also tied to participation. For example, vocalists and instrumentalists cannot participate in parts that are “too high” or “too low” for them to create the sounds.
- Simultaneity is also tied to participation in the music. For example, some roles (such as playing the saxophone and singing) cannot be performed by the same person simultaneously.

Exploring Music Theories: Volume

Some of the concepts and terms that insiders use to understand and discuss a music tradition may be related to volume, that is, the loudness or quietness of the music. Because humans are not capable of distinguishing among small variations in volume, this aspect of music is often described only generally, providing a relatively accessible entry point into theory traditions. An important exception to this involves practices that use modern technologies to measure and manage musical volumes; discussion of volume in these traditions can be quite technical, amounting to a music theory that is often most highly developed by those who process the sounds, rather than by the instrumentalists who originally make them.

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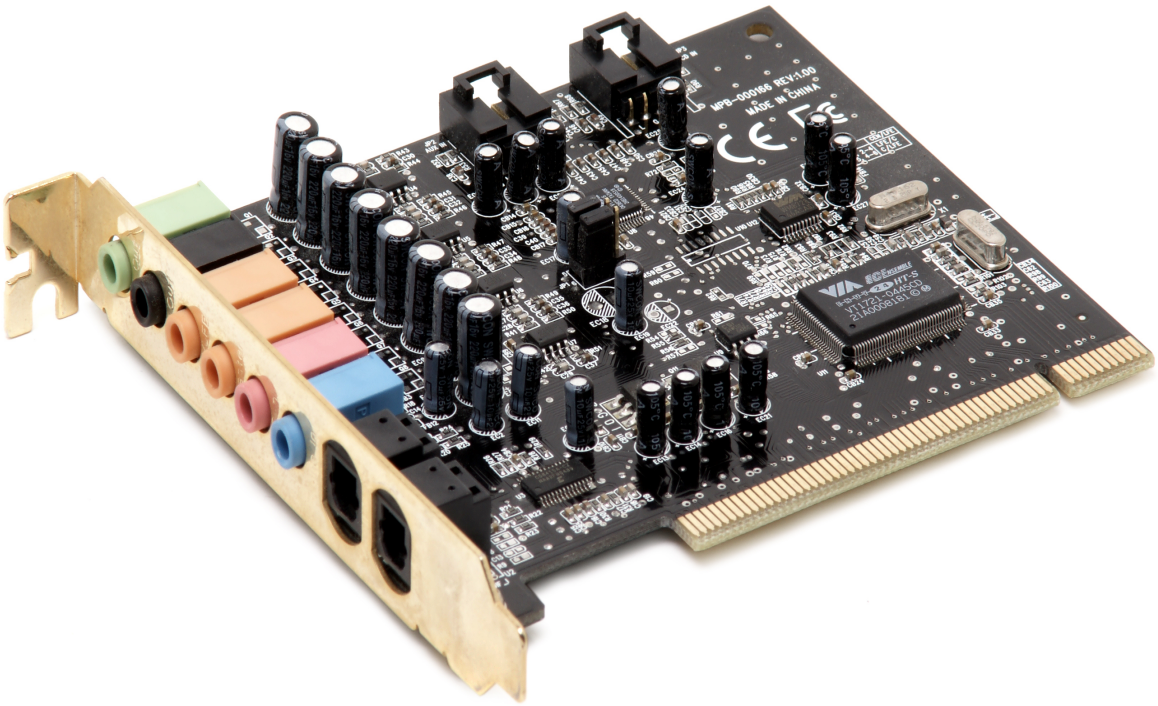
Introduction: Volume as the loudness or quietness of musical sounds

Volume refers to how loud or quiet a sound is. Like timing and frequency, volume is a characteristic of all sounds and thus an aspect of all kinds of music. However, humans are not as good at distinguishing small differences in volume as we are in distinguishing small differences in wavelength or timing. Volume also suffers an additional complication, from the perspective of those organizing the music, because it is often greatly affected by things that are not directly under their control, such as the distances among participants, the walls and other objects that make up the performance space, or the quality and volume of a recording of the performance.

Also, some instruments are capable of playing a wide range of volumes, such as pianoforte (an instrument whose name literally celebrates the fact that it can play both quiet and loud sounds). But many instruments have a much narrower range of possible volume, such as bamboo flute (quiet) or bagpipes (loud). Nevertheless, volume is often used to purposefully organize musical sounds. For example, one part of a performance may be noticeably louder than the previous part, helping to make the organization of the music more audible. So a music tradition may include terms and concepts for discussing volume.

These terms and concepts may be part of the lingo of the participants who actually create or perform the sounds (for example, those who play instruments). However, in modern times those who have the most control over volume are often not the performers. Instead, a different set of participants uses a different set of “instruments,” such as microphones, amplifiers, and mixers, to set the desired volume for the sounds after they are produced. With these tools, the volumes of all of the various sounds can be carefully balanced to produce the desired musical effects, creating a carefully "polished" sound that some listeners may prefer to the less-carefully-controlled actual performance. Some performers who work with electric or computer-based instruments (such as electric guitars or digital audio workstations) also become adept at using these volume-controlling technologies and their relevant concepts.



Traditionally, volume was not easy to control. It depended on many factors such as the number of instruments, types of instruments, the performance space, and and distance to the listener. New technologies make it possible for both music producers and listeners to specify the volume of the sounds.

If modern technologies for amplifying or controlling sound volume are an integral part of the music tradition that interests you, you may want to study some of the terms and concepts involved in these technologies, as well as the terms for volume used by the music's performers. If modern technologies are considered peripheral, irrelevant, or inauthentic to the tradition, then you probably will only benefit from the volume concepts used by the performers.

Research ways that volume is used and understood

As you research the music tradition that interests you, make sure you keep notes that will help you remember what you have found and where you found it. You may find that the tradition has fewer specific terms and concepts for volume than for other aspects such as timing or wavelength. However, because most performers do not worry much about the precise volume of their sounds, you may also find that discussions of this aspect of the music are less technical and relatively easy for an outsider to understand. (The main exception to this will be technologies for controlling volume; discussions of these tools may get very precise and technical.)

Search for general **terms related to the volume, loudness, or quietness** of the musical sounds. For example, for historical reasons, common practice often uses Italian terms, even in English-language discussions: **piano** means "quiet," **mezzo forte** means "medium loud," **forte** means "loud," **pianissimo** means "quieter than piano" and **fortissimo** means "louder than forte."

A tradition may also have **terms for changes in loudness**. For example, in common practice, **subito piano** means "suddenly quiet," while **decrescendo** means "gradually quieter."

If specific instruments in the tradition interest you, you may also want to search for **terms that describe playing techniques or equipment that produce particularly loud or quiet sounds**. For example, violin players can "bow on the bridge" and trumpet players can use a **mute** to create a quieter sound.

If technologies for controlling volume interest you, you may be able simply to **search for general information about how sound-production technologies are used**, regardless of the music tradition that interests you. These technologies are so new that the terminology and usage of them is very similar for many music traditions. The important exceptions are those, such as various rap and metal traditions, that may use the same equipment for creating or processing the sounds, as well as for controlling volume. In these traditions, discussions of the technologies may also include terms that are central to the specific tradition. For example, "distortion" is a crucial aspect of metal sounds, and a rap DJ has to be concerned with volume and many other aspects of the sound "clips" or "loops" being "mixed."

You may also want to research the **cultural aspects of music volume**. Volume can be a particularly telling aspect of music culturally, as it may be chosen by listeners playing recordings, as well as by the musicians producing recordings or live music. For example, playing recordings of a certain tradition loudly may be considered by insiders to be an assertion of identity, or may be considered by outsiders to be rude. Playing music quietly may be considered by insiders to signify refined tastes, or may be considered by outsiders to be dull.

Listen for the uses of volume in the music

1. To experience the music at an authentic volume, try to attend at least a few live performances in various venues. We all tend to listen to recordings at the volume that we find comfortable or convenient, which may not create an authentic experience of the music's volume. For example, many genres of Indonesian gamelan music are very loud. The "beating" effect created by an extremely precise organization of wavelengths (tuning) is not audible when a recording is played quietly. Similarly, the full effects of heavy metal rock, or of bagpipes, or pipe organ, simply are not experienced by quietly playing a recording of them. If it is not possible to attend live performances, try to find some very high quality recordings of the music and listen to them at an authentic volume, at least a few times. A video recording, even if of low audio quality, may give you a sense of the authentic volume, based on the size of the space, the number of people participating, and any other activities that are going on simultaneously with the music.
2. While listening to the music at authentic volumes, notice any effect of the volume on your experience. For example, are the quiet parts so quiet that you must play close attention to hear them? Are the loud parts so loud that you can feel the vibrations through your stomach or feet? Do you enjoy the authentic volumes, or do you find them uncomfortably loud or soft, and is the discomfort mainly physical (for example, actually overloading your eardrums), or mainly psychological (for example, concern that it will bother other people).
3. If you are attending a live performance or watching a video of a performance, notice any effect of the volume on the insiders. Do quieter or louder volumes noticeably affect their reactions to the

music? (For example, do they dance more enthusiastically when the music is louder?)
4. Listen to an entire piece, noticing when and how the volume changes. Are changes sudden or gradual? Do they follow predictable patterns that are tied to other aspects of the music's organization? If so, what do they seem to be tied to? What allows you to predict an upcoming change in volume?
5. Notice whether specific instruments or specific participants are associated with louder or quieter sounds. Are specific ranges of wavelengths (for example, very "high" sounds or very "low" sounds) associated with louder or quieter sounds?

Join in at the right volume

1. If it is appropriate and comfortable for you to participate in a sound-making peripheral role in an authentic live performance (for example, clapping along with the music), join in with the same volumes as insiders in the same role.
2. If it is appropriate and comfortable for you to participate in a responsive role in an authentic live performance (for example, dancing along with the music), join in and respond to the volume of the music (and changes in volume) in the same way as insiders in the same role.
3. Regardless of whether you are able to join in a live performance, choose an authentic recording of a piece in the tradition that interests you.
4. Choose a way of joining in (for example, singing, or using found percussion or body percussion). Authentic instruments and sounds are preferable if comfortable; if not, choose any comfortable way of making sounds that fit in with the recording.
5. If possible, play the recording at an authentic volume.
6. Play along with the recording, with a volume that balances and blends well with the volume of the recording (in other words, the sound of your part should neither overwhelm, nor be overwhelmed by, the sounds in the recording). Be sure to change volume along with the recording, changing volume suddenly or slowly, as appropriate.
7. If this is challenging at first, practice the same piece several times until you learn to predict, and play along with, the volume changes.

Play with the volume of the music

- If you feel very comfortable with the part that you were playing in the previous activity, try recreating your part alone, including the changes in volume, without playing the recording.
- If you noticed a particular instrumental technique or sound quality associated with loud or quiet volumes, try recreating that technique or sound quality, on an authentic instrument, or on a more familiar instrument from your own tradition, or using virtual instruments on a digital audio workstation.
- If the tradition that interests you uses volume in any ways that are very different from more familiar traditions (for example, by increasing the volume very gradually, or by always playing repeated sections more loudly the second time), try to create a performance that mimics that particular way of using volume. You can choose either authentic or familiar instruments for this activity, and either a piece authentic to the tradition or a familiar piece from your own tradition.

Connect volume to other aspects of music

Volume is tied to other aspects of a music tradition. If you have found specific aspects of volume that interest you, they may suggest ties to other aspects of music that you might want to follow up on, for example:

- An organization concept may be tied to the volume aspect of music. For example, in many popular song traditions, the refrain is typically louder than the verses.
- The ways that music is remembered may be tied to the volume aspect of music. For example, louder parts may be remembered longer and more accurately by more insiders than quieter parts.
- Volume is also closely tied to instruments. For example, many instruments must be played loudly (or quietly) in order to create the sounds considered appropriate for the tradition.
- Participation is also tied to the volume of music. For example, as a general rule, the more participants who make sounds, the louder the volume of the music.

- The flow of time is also tied to the volume aspect of music. For example, a common way to organize the flow of time in a piece of music is to establish a regular, predictable pattern of louder and quieter sounds at regular intervals in time.
- Wavelength is also tied to the volume aspect of music. For example, most voices and instruments have a particular range of wavelengths at which they sound louder than in other ranges.
- Simultaneity is strongly tied to the volume aspect of music. For example, as a general rule, more sounds happening at the same time will make the music louder.

Exploring Music Theories: The Flow of Time

The flow of time is an aspect of all music, and most music traditions include terms and concepts used to understand, discuss, and represent timing. Because most people, even those untrained in music, are good at distinguishing small differences in timing among various sounds, this aspect of a music theory is often particularly rich and detailed.

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Introduction: The flow of time is fundamental to music

Time is a fundamental, inescapable aspect of music; we hear music as the sounds flow by in time. Organizing the timing of the sounds is therefore one of the main ways to create music that "makes sense," giving it a form that can be planned, heard, and understood.

Organizing the time aspect of music can be done at many different scales simultaneously, for example:

- Sounds can happen "at the same time" or partially overlap in time (for example, with a new sound beginning before an earlier sound ends). Terms and concepts for sounds that overlap in time are discussed in the module on simultaneity.
- Over long time scales, noticeable repetitions and changes in the sounds create an audible overall structure to the music, discussed in the module on organization and meaning.
- Over shorter time scales, **sounds can follow each other closely enough that they are heard and understood in terms of their relationships to each other in the flow of time**. It is the terms and

concepts that describe such short-term time relationships that are the focus of this module.

Timing is such an important aspect of music that some musicians, such as the conductors of Western orchestras, specialize in providing signals that help the other musicians coordinate the timing of the sounds.

Note: When researching the terminology of musical timing, be careful not to confuse it with terms that refer to the wavelength of sounds. The wavelength of a sound is related to the timing of its vibrations: The shorter

the wavelength of a sound, the more waves (vibrations) it has per second. In Western science and engineering, vibrations per second is called **frequency**. Although the word “frequency” in general refers to how often something happens as time flows by, the “frequency” of a sound happens so fast that people do not experience it in terms of how often the sound waves go by. Instead, we experience it as “how high or low” the sound is. See the course module on wavelength for more about musical terms related to wavelength and frequency.

Research terms and concepts for musical timing

As you research the music tradition that interests you, make sure you keep notes that will help you remember what you have found and where you found it. You may want to be able to refer to descriptions and examples that you have seen previously, whenever you believe that you have heard a concept for yourself, or when you are trying to understand how one term or concept is connected to another. Some of the concepts used to discuss the flow of time in music may be easy for you to grasp. For example, most people find it easy to understand the concept of “the beat.” On the other hand, more complex concepts may be quite challenging to recognize by ear as the music flows by. For example, most people need plenty of practice to learn to follow the overall form of long pieces from classical traditions. Remember that your notes are for your own use; don't be afraid to make provisional guesses as to what a term means and what is a good example of it. Mark your guesses according to how certain you are of them, and look for more information that will help you confirm or refine them.

Search for **terms that refer to time, timing, or lengths of time** in the music. The general common-practice terms **rhythm** and **beat** have become so widely used in English-language discussions of music that it may be useful to search in the tradition you are studying for any concepts discussed in terms of rhythms or beats, but be aware that the words may have slightly different meanings than they do in your own tradition.

Other terms that are generally used to discuss timing in many common-practice traditions include:

- Groove
- Meter
- Swing
- Tempo

Another general term for timing is very widely recognized, although it does not come from common-practice traditions: **tala** (or **taala** or **taal**). Although many groups prefer a local term that has a similar meaning, searching for discussions that refer to this concept can be particularly useful for music traditions originating in southern or southeast Asia, the Middle East, or northern Africa.

If the tradition typically uses written music, you may find it useful to learn the **terms that describe how time relationships are written**, even if you do not plan to learn to read the music! For example, the common practice terms for writing rhythms are often used to describe the sounds themselves, as well as the way the sounds are written, for example:

- Time signature
- Measures/Bars
- Notes
- Rests

If many pieces in a music tradition feature the same complex timing relationship, you may find it very useful to search for **terms that name these specific timing relationships**. Common practice traditions actually tend to use less complex, more basic and predictable timing relationships than many other traditions, but even common practice includes terms for specific types of complex rhythms, for example:

- Syncopation
- Hemiola
- Tuplets
- Borrowed Meters

When similar sounds follow one after another in music, they are often understood by listeners as a single, meaningful musical idea or event, in the same way that sounds that follow each other in language are understood as

meaningful words, phrases, and sentences. As in language, these meaningful arrangements-of-sounds-in-time attract the listener's attention. They often contain much of the intrinsic “meaning” that insiders hear in the music, so it can be very useful to search for **terms that refer to a set of musical sounds that are heard one after the other and are understood as a single musical idea or event**. For example, in common practice traditions, there are several widely-used terms that refer to such attention-getting arrangements of sounds, including:

- Melody
- Phrase
- Lick
- Theme
- Motive or Motif

If the music tradition includes **specific instruments or participation roles or activities that are associated with organizing the sounds in time**, you may find it useful to research these. These instruments and roles may have their own lingo for discussing practices and techniques for organizing the sounds within the flow of time. For example, in Western classical traditions, **conductors** use **conducting patterns** to help the musicians keep track of where they are in the meter of the music. In Indian classical traditions, **tabla** players have many terms for the various ways the drum may be hit to create the tala.

You may also want to research **the cultural roots and meanings of the ways timing is used in the music**. For example:

- What cultural meanings are associated with the attention-getting musical “ideas” that arise when sounds are grouped closely together? For example, a specific “melody” or “theme” might be instantly recognized by nearly all insiders as related to weddings, or Christmas, or a movie character.
- What cultural meanings are associated with any regular, repeated patterns of sounds in the music. For example, a specific type of “beat” may be strongly associated, not only with a genre of music (salsa, for example), but with specific places, groups of people, and social activities.

Listen for short-term sound relationships created by the flow of time

1. Choose audio or video recordings in the tradition that interests you. You can use either two recordings of different pieces that seem to take different approaches to the flow of time, or else one recording of a piece that has at least two sections that have very different approaches to the flow of time. For example, one “time flow” might feature sounds that last a long time and flow by in a very leisurely manner, without a steady pulse, while the other might feature short sounds flowing by rapidly with a very steady pulse.
2. Choose a short time period in each piece (or section) that is interesting to you and easy to listen to repeatedly.
3. Listen to both of your chosen time periods repeatedly until you become familiar with, and able to predict, what happens in them as the sounds flow by in time. If you find this too challenging, choose a shorter period of time, or one in which the music is less complex, to focus on.
4. Identify sounds that happen so regularly in time that they are easily predictable (for example, a drum beat). If possible, describe the regularity of the sound using terms from the tradition. Create as complete a description as you can. (For example, when describing a drum beat in common practice, you might describe the tempo and the meter, which part of the meter the drum sound occurs on, and any “rests” in the sound.) If not, you can use terms from a more familiar tradition, or even make up your own terms, and do some additional research to at least make some “educated guesses” about which authentic terms and concepts might apply.
5. Identify specific events that draw your attention and consist of sounds that follow one after the other. If possible, describe such events using terms from the tradition. If not, you can use terms from a more familiar tradition, or make up your own descriptive terms, and do some additional research to at least make some “educated guesses” about which authentic terms might apply.
6. If you identified more than one "event" that happened in the same time period of a recording, describe the time relationships among the events. For example, does one seem to follow the other to create an

extended “meaningful idea”? Do any of them overlap in time? Is any event an exact or near repetition of a previous event? Do repetitions follow immediately, or is there a short or long time in between them? If a repetition is slightly different, is the timing within the group of notes one of the things that changed? If so, how has it changed? Again, use authentic terms, or your best guesses regarding authentic terms, as much as possible.

Remember and join in with the flow of time

1. Choose a method of turning what you learned about the pieces in the previous activity into a written version of the time flow of the piece(s). This can be anything from a precise, formal written version of the timing to a general, informal chart of events. You can use a method that is authentic to the tradition, or one from a more familiar tradition, or make up your own, or use any combination or variation of these.
2. Use the notes you created in the previous activity to begin charting out your written versions of the two time periods you were studying. Remember, you only need to make a record of the timing of the sounds and groups-of-sounds that you noticed. You may be able to create your entire chart by memory, or you may need to listen to the recordings several more times.
3. Choose any comfortable method of joining in with the sounds and events that you have heard. For example, you might clap or chant along with them, or play them on a familiar instrument. Remember, you are only trying to reproduce the timing; it is not necessary, for example, to reproduce the wavelength of the sounds.
4. When you have a first draft of your chart, try using it to join in with the recording. First, try to join in with any of the regular, highly-predictable sounds that you described and charted. Then, try to join in with any of the specific events that you described and charted.
5. Notice any difficulties you are having with the timing. Are they related to ways that the unfamiliar tradition is different from your own familiar music traditions? You may have to revise your chart to make it more specific or practical, or you may have to experiment with different methods of joining in, to find one that feels relatively comfortable and satisfying, or you may simply need to listen and

practice until the unfamiliar approach to timing starts to feel more natural.
6. When you are satisfied that are joining in with the correct timing, as the sounds and events flow by, you are ready to try the next activity.

Play with the flow of time of the music

1. For this activity, you can use the same types of sound (singing, chanting, clapping, playing an instrument) that you used to "join in" with the recording in the previous activity. Or, if you avoided using a familiar instrument because its sounds did not fit in with the sounds of the recording, you may prefer to use the familiar instrument for this activity. If you like working with digital technologies, you can use a digital audio workstation to create your "performance."
2. Try to reproduce the feeling of the flow of time in the music without playing the recording. First, reproduce on your own, as well as you can, any repeated, highly-predictable sounds (such as a drum beat) that you described and then practiced with the recording.
3. Then try to reproduce the specific events that you described and practiced. Again, it is the timing only of the events that is the main goal. You can even choose events from your own tradition (such as a favorite melody) and try to play them using the timing of the event in the recording.
4. In each case, listen carefully and try to judge how closely your lone efforts mimic the authentic recording. If you find it difficult to perform and judge at the same time (many people do), then record yourself and compare your recordings to the authentic recordings. (You may want to keep your self-recordings as part of your notes on this course, if you would like to keep track of your improvement in mimicking the authentic sounds of the tradition. Or you may prefer to destroy recordings that you make for the purpose of self-constructive criticism, if you are concerned that others might hear them and judge them too harshly.)

Connect the flow of time to other aspects of music

The way a music tradition views the flow of time naturally involves all other aspects of the tradition. If you have found specific flow-of-time concepts that interest you, they may suggest ties to other aspects of music that you might want to follow up on, for example:

- The ways music is organized are typically closely tied to the flow of time. For example, in many south Asian and middle eastern traditions the tala of a piece is a basic concept that affects the way pieces are organized, over both shorter and longer time scales.
- The ways music is remembered are likely to depend strongly on the flow of time. For example, sounds that repeat in time in a regular pattern may be remembered in terms of the pattern, rather than as individual sounds.
- Issues of flow of time are also tied to the ways instruments are played. For example, some instruments can play many sounds in very quick succession, while others cannot.
- The flow of time is also tied to participation in the music. For example, when the flow of time in the music is divided into predictable patterns (such as a regular “beat”), it is easier for large numbers of people to use that predictability to participate actively in the music (for example, by “clapping on the beat”) without causing chaos.
- The flow of time is also tied to the volume aspect of music. For example, a common way to organize the flow of time in a piece of music is to establish a regular, predictable pattern of louder and quieter sounds at regular intervals in time.
- The flow of time is also tied to the wavelength aspect of the music. For example, changes in wavelength over time (such as those that create a “melody”) naturally attract listeners' attention.
- The flow of time is of course closely tied to all simultaneity issues. For example, whether sounds are perceived as “simultaneous” depends on how closely they overlap each other over the flow of time.

Exploring Music Theories: Wavelength

All musical sounds consist of vibrations in the air. The wavelengths of the vibrations greatly affect the sound of the music, so a music tradition may include many concepts and terms to describe this aspect of the music. Most people can discern between small gradations in wavelength, but cannot name them by ear, so this can be a particularly challenging aspect of the theory to master for those who cannot play specific wavelengths, using either an acoustic instrument or electronic equipment.

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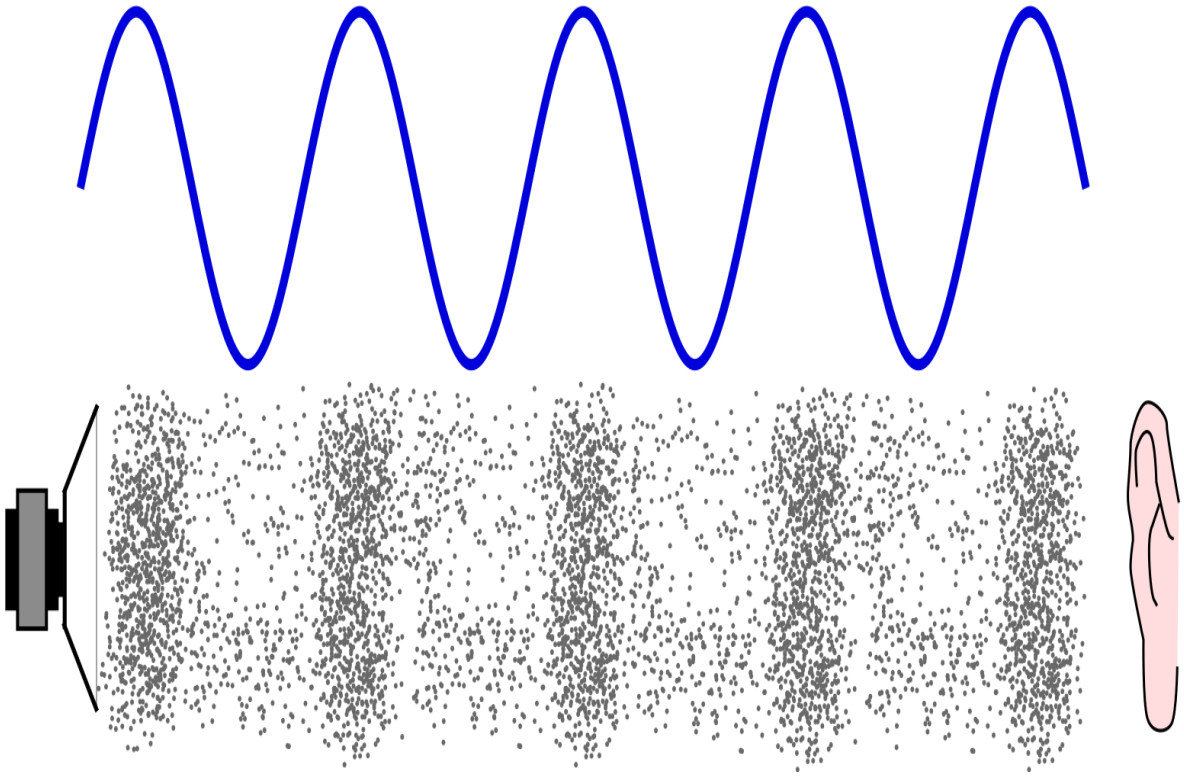
Introduction: The Wavelengths and Frequencies of Sounds

Wavelength is a physical aspect of all sounds. Every sound you hear is created when something disturbs the air, causing the air to vibrate. The distance between one wave of the vibration and the next wave is the wavelength of the sound. In most English-language music traditions, sounds with longer wavelengths are described as sounding “lower,” and sounds with shorter wavelengths are described as sounding “higher.” As a general rule, the larger or longer a sound-maker is, the longer the wavelength of the sounds it makes. A large object, a long musical instrument, and a tall man, tend to make sounds with longer wavelengths, and lower sounds, than a small object, a short musical instrument, and a small child. Many musical instruments are designed so that players can create a variety of wavelengths (higher and lower sounds) with the same instrument. For example, an instrument might have strings of different lengths, or techniques for making the vibrating part of a string longer or shorter.

Note: Musical sounds are often discussed as we typically experience them, as if they have one specific wavelength or no specific wavelength. This is the type of discussion that is featured in this module. Sounds that seem to have no specific wavelength, such as rattle or snare drum sounds, are not included in such discussions. Sounds that seem to have one specific wavelength, such as guitar or flute sounds, are discussed in terms of that wavelength. In terms of the physics of sound, nearly all musical sounds make the air vibrate at many different wavelengths simultaneously; this aspect of music is discussed in the course module on simultaneity.

Like timing, wavelengths is an inescapable, physical characteristic of all sounds, and therefore an aspect of all kinds of music. Also like timing, most humans are naturally good at discerning small differences or changes in wavelength. In other words, it is easy for us to distinguish between two sounds that are “almost” the same wavelength or that are “almost” simultaneous. This makes the **relative wavelength** of musical sounds, like their relative timing, a useful, easy-to-hear way to organize music.

Sound Waves



All sound is made up of waves of air.

However, most people find wavelength terms and concepts to be more challenging than the terms for timing and other aspects of music. This is because humans are not naturally good at discerning specific wavelengths on an absolute scale. (In other words, most people can easily learn to distinguish whether one musical sound is higher or lower than another, but find it difficult to learn to recognize that one of the sounds is the same wavelength as the 77-cm-wavelength sound they heard yesterday. This is similar to our sense of length; most people can easily decide which of two objects is longer, but find it difficult to learn to recognize which one is exactly one meter long.)

Wavelength terms and concepts tend to be developed by insiders to a music tradition who share reference points that they can easily check (for example, the sounds made by a particular instrument or tuning tool). Unless you can also use these shared reference points, you may find it difficult to study their wavelength-based concepts in any depth. (Compare this with the aspect of timing, in which reference points such as easy-to-hear “beats” are typically shared even by casual listeners.)

You may be able to use an authentic instrument, a familiar instrument, a tuning tool, a digital audio workstation or other tool or technology as a reference point to study the wavelength aspect of music. If this does not sound feasible to you, you may prefer to simply study the more general wavelength terms and concepts that are recognized by all of the insiders to the tradition, including those who simply listen to it.

Note: The high-or-low aspect of sound is often described in terms of frequency rather than wavelength, especially by scientists and engineers. **Frequency** simply refers to how often a wave of the sound passes by. Since waves with shorter wavelengths are closer together, the shorter the wavelength of a sound, the higher the frequency. In other words, “high”

sounds have a high frequency. Unfortunately, the term “frequency” also has a general meaning that can be used to discuss timing, which in music is a completely different issue from wavelength. In this course, timing refers to lengths of time that humans can distinguish, for example, as when two musical sounds clearly happen at different times. In this sense, “how frequently does that sound happen?” might be answered “it happens on every beat.” When engineers discuss the “frequency” of a sound, on the other hand, they are referring to the vibrations in a single sound. These vibrations happen so frequently that they are not heard as separate sounds, but rather as the “high or low” aspect of a sound. To avoid any possible confusion, I will avoid the term in this course, but if you become highly interested in this aspect of music, you may want to search for information on frequency.

Research ways that wavelength is understood and used in the music

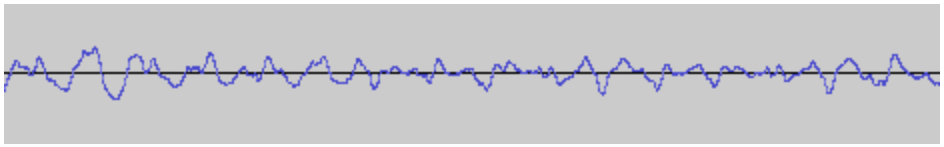
As you research the music tradition that interests you, make sure you keep notes that will help you remember what you have found and where you found it. It may take some time and effort to reach those “aha” moments when you are certain that you can hear in the music an example of a frequency concept. When you believe that you have heard it for yourself, or when you find descriptions that seem particularly useful, or when you are trying to understand how one term or concept is connected to another, you may want to be able to refer to descriptions and examples that you have seen previously.

A single music tradition may have a very large number of terms and concepts that are used to discuss frequency. They may be grouped within larger concepts that are treated separately within the music theory. For example, in common practice theory, concepts related to **tuning** (the precise frequencies that are allowed to be heard in a piece of music) are usually treated as a completely different subject from concepts related to **melody** (the way the most noticeable frequency changes over time) or **harmony** (the rules governing which frequencies may be heard simultaneously). In

fact, typical common-practice theory courses often treat tuning as a standard that is not discussed at all, while spending nearly all effort on discussing harmony. Obviously, that approach is not helpful when studying other traditions. Because wavelength is such a challenging and extensive subject, you may find it more useful than usual to focus on a specific question or a specific goal as you search for relevant terms and concepts and then work through the activities. For now, ignore terms and concepts that don't seem relevant to your immediate interest. As with any of the modules in this course, you can repeat the activities as many times as you like, at “higher” levels or with different goals and questions each time, either immediately or with some time off to practice what you have learned and connect it to other aspects of the music.

Search for **general musical terms that describe the "high" or "low" aspects of the sounds, or are described as related to the frequency or wavelength** of the sounds. For example, the common-practice terms **pitch** (the high-or-low aspect of a musical sound) and **tone** (a sound with a specific pitch) are general terms that are used to discuss either tuning or melody or harmony.

Note: Although originating with common practice music, **the terms “pitch” and “tone”** may be used in other traditions, so you may find it useful to search for discussions of the tradition that interests you that use these terms. You may also find it useful to search for information on **unpitched** sounds, referring to sounds with mixed wavelengths, such as drum beats. However, be careful with the term **tonal**, which **often refers to an aspect of common-practice music that is NOT shared by most other traditions**.



Even a single sound is not made of a single

wavelength, but a complex waveform made of different wavelengths vibrating the air at the same time. If the combined wavelengths still form a very regular wave, you hear a sound that seems to have a specific wavelength. If the complex waveform does not include a regular pattern, the result is a "noisy" or "unpitched" sound.

In general, you will want to read musical rather than scientific or engineering discussions of wavelength, but there are some exceptions. If you are very interested in the uses of modern technology to create or alter the sounds used in music, you may find it useful to **search for discussions of how to use music-creation technologies such as digital audio workstations** that focus on choosing or manipulating frequency, wavelength or pitch. Note that these technologies allow even novices to precisely control the pitches of sounds, making them excellent tools for anyone who is very interested in this aspect of a music tradition. Also, if you are interested in the way that multiple wavelengths combine to form a single sound (such as a flute sound or a drum sound), you may want to search for **scientific or engineering discussions of instruments, the human voice, timbre, or the acoustics of music**. Music-based discussions of this aspect of music often use the terms **acoustics** (the science of sound), **timbre** (the quality of a sound that is due to its construction from various wavelengths), **or tone quality**.

If the tradition that interests you uses very different rules from your familiar tradition to choose the wavelengths that are allowed in the music, you may want to **search for terms and concepts that are used in discussions of tuning**, a common-practice term that is sometimes also used in other traditions. Other terms that are widely used to discuss this aspect of music include:

- Temperament
- Intonation

If the tradition that interests you uses very different rules from your own tradition to organize the way pitch changes over time, you may want to **search for terms and concepts that are used in discussions of melody**, a general common-practice term that is sometimes also used in other traditions. Other terms that are widely used to discuss this aspect of music include:

- Raga, rag, or raag
- Theme, lick, motif, or motive
- Line (as in “bass line,” “soprano line” or “saxophone line”)
- Ornament or ornamentation

If you are interested in the ways that sounds of different wavelengths are used simultaneously, you may want to **search for terms that are used to describe harmony**, a general common-practice term that is sometimes also used in other traditions. This is the aspect of music that has become most thoroughly explored and highly refined in common practice, so you may find many of the common-practice terms to be useful search terms, regardless of which tradition you are studying, for example:

- Harmony, harmonious, or consonant, or consonance
- Chord
- Drone
- Cluster
- Dissonant or dissonance

You may also want to research **the cultural meanings associated with the ways wavelength is used** in the music. For example:

- Do insiders explain the rules for organizing wavelengths by tying them to other aspects of the culture?
- Are particular uses of wavelength associated with other aspects of life? For example, In India, a particular raga may be strongly associated with a particular mood, season, or time of day. In American movies, different types of harmony are associate with scenes that are frightening, eerie, romantic, or heroic.

Listen for the uses of wavelength in the music

1. Choose two or three favorite recordings in the tradition that interests you.
2. Listen carefully (repeatedly if needed) to a short section of each recording. If possible, choose a favorite section that you find particularly easy to remember.
3. What portion of the sounds (most, all, only a few, none?) seem to be sounds that do not have a specific wavelength (such as chanted words, hand claps or drum beats)? What portion of the sounds seem to have a specific wavelength (such as sung words, or flute or guitar sounds)?
4. In each of your chosen sections, focus on listening to the specific-wavelength sounds. How complex is this aspect of the music? Does the wavelength of each sound seem to remain steady, or is it ornamented or varied in some way? Is it easy or difficult to follow a particular instrument (or voice), or a particular set of sounds?
5. Think about the wavelength-related concepts that you are most interested in hearing and understanding right now (for example, tuning, ornamentation of melody, or harmony). Of the sections that you have been listening to, choose the one in which you believe it will be easiest for you to hear that aspect of the sounds.
6. Focusing on the easiest-to-hear example, listen for the concepts that you have been researching. Feel free to choose a different example, if you decide that the concepts might be easier to hear in a different piece or a different section of this piece.
7. Once you believe you have heard an “easy” example of any of the concepts you are studying, listen for that same concept in other pieces. If you are not certain, search for examples that you are more sure of, or search for clues that will confirm or refute your guess. For example, you might be able to find a chord chart of the piece, which would confirm or refute that you are hearing a minor chord.
8. If there are other concepts that you would like to listen for right now, you can repeat the previous two steps, listening for a different concept, as many times as you like. In that case, you can then go on to the following activities, working with the various concepts that you have learned to hear in the music. Or you may prefer to go on and do the

following activities with each concept individually as you learn to hear and recognize it.

Join in on the right wavelength

1. Choose the section of recording from the previous activity in which it was easiest for you to hear a wavelength-related concept in a set of specific-wavelength sounds (for example, the way a specific melody is ornamented, or the way the harmony changes over time).
2. Choose a way to join in with those sounds as you play the recording. For example, you may try to sing or hum along with them, play them on an authentic or familiar instrument, or turn them into a clip for your music-creation program, and add sounds of your own.
3. Practice joining in with the recording, with the goal of producing sounds that blend in well with the recording. You may find this challenging. For example, if it is tuning that interests you, you may find it quite challenging to reproduce the unfamiliar tuning accurately. Feel free to either decide that what you can do is "good enough for now" or to practice this exercise often and regularly if it is important to you to master this aspect of the tradition.
4. As a general rule, aim for improvement over several practice sessions, rather than perfectly authentic sounds. The main goal is to become more aware on a practical level of what is needed to produce authentic-sounding versions of the music. For example, is it easier if you use a familiar instrument tuned in an unusual way? Attempts to create the correct wavelengths for yourself can also help you develop a more discerning “ear” for the sounds, even if your attempts sound "inadequate" to you.
5. If you found it relatively easy to blend in with the easy-to-hear example, you may want to challenge yourself to sing, hum, or play along with a more challenging example of the concept.
6. If you are studying more than one wavelength concept, repeat the activity as many times as needed to practice each concept for yourself with the recording.

Play with the wavelengths of the music

- From the previous activity, choose the concept, the example of the concept, the method of joining in, and the techniques for producing a more-authentic sound that you found easiest or most satisfying.
- Try to recreate the sounds for yourself (with voice or instrument) without the recording. After each attempt, listen again to the recording, and note the extent to which you are capable of keeping to the authentic wavelengths on your own. (If it is difficult for you to remember what you sounded like on your own, try recording yourself and comparing your recording to the authentic recording.)
- If you enjoy working with digital music technologies, you may find it easiest to recreate the music for yourself by using a computer-based tool to create sounds with the appropriate wavelengths, and then use these sounds to recreate a version of what you heard in the recording. Again, compare the sound of any versions you create with the sound of the recording, with the goal of making your version sound a bit more authentic.
- If you are not content with the results, practice to see whether you can improve, or try a different method of creating your sounds. Again, the aim is not so much perfectly authentic sounds as a practical awareness of the differences between the music you are studying and more familiar sounds, and awareness of what is needed to bridge those differences. You may develop a deeper and more knowledgeable appreciation of the tradition when you realize that some of the sounds are more "foreign" than you realized!
- If you are studying more than one wavelength concept, or enjoyed more than one recording example, or believe that you may be more successful with a different example or a different instrument, make a different set of choices and repeat this activity.

Connect wavelength to other aspects of music

The way a music tradition treats wavelength naturally involves all other aspects of the tradition. If you have found specific wavelength concepts that interest you, they may suggest ties to other aspects of music that you might want to follow up on, for example:

- An organization concept may be strongly tied to the wavelength aspect of the music. For example, in many Balinese gamelan traditions, a major aspect of form is indicated by long-term repetitions in the lowest-sounding instruments, a series of large gongs.
- The ways that music is remembered may be strongly tied to the wavelength aspect of the music. For example, limiting the number of different wavelengths that are used in a piece tends to make it much easier to remember.
- Wavelength is also strongly tied to the ways that instruments are played. For example, most instruments can only make their characteristic sounds within a limited range of wavelengths.
- Wavelength is also tied to participation. For example, vocalists and instrumentalists cannot participate in parts that are “too high” or “too low” for them to create the sounds.
- Wavelength is also tied to the volume aspect of music. For example, most voices and instruments have a particular range of wavelengths at which they sound louder than in other ranges.
- The flow of time is also tied to the wavelength aspect of the music. For example, changes in wavelength over time (such as those that create a “melody”) naturally attract listeners' attention.
- Simultaneity is also strongly tied to the wavelength aspect of the music. For example, many traditions have rules regarding tuning (permitted frequencies) that are dictated by their sense that some frequencies should not be played at the same time.

Exploring Music Theories: Simultaneity

There are many simultaneities that are crucial to the experience of music, including simultaneous wavelengths that make up the timbre of a sound, simultaneous sounds, simultaneous events unfolding in the music, and other events, such as dancing or ceremony, that happen simultaneously with the music. Understanding how these aspects of music are organized, understood and discussed within a music tradition can be challenging but particularly rewarding in understanding the tradition.

Note: This module is part of Exploring Music Theories, a learning by doing course intended to help you explore the theories of music traditions that are not very familiar to you, or to compare different music theories to each other, or to explore music theory itself as an idea. It is a short experimental course that will be refined and expanded if there is sufficient user interest and feedback.

Introduction: Sounds that happen “at the same time” in music

As discussed in the flow of time module, music is always experienced in time, so theories of music often include concepts and terms for discussing the time aspect of music. In many music traditions, this includes concepts that refer to sounds that happen at the same time, or that overlap in time or develop over the same period of time. Most traditions place fairly strict limitations on what may be heard “at the same time,” due to limits on the average person's ability to listen to, and understand, simultaneous sounds. Too many overlapping sounds are interpreted by human ears as “noise” rather than “music.” In fact, sometimes outsiders to a music tradition describe it as “noisy” precisely because they cannot make sense of everything that is going on in the music. Insiders can make better sense of any complexity, because they have become so familiar with the tradition that they can effortlessly categorize and group its sounds, for example, automatically recognizing several sounds as being “essentially the same” or as being “a melody” or “a chord.”

Even insiders can become overwhelmed when too many different things are going on simultaneously in a piece of music, due to fundamental limits on the human brain's ability to process what we hear. Therefore, some of the most basic and crucial concepts in a tradition are the ones describing “how sounds may happen at the same time.” Any music that breaks these particular “rules” may not receive a favorable reception from insiders, since it requires them to work harder to listen and understand the music.

Note: As with all of the aspects of music discussed in these modules, “rules” or “expectations” are set by the insiders to a tradition, who also decide how strict or important each expectation is. Breaking one “rule” might be perfectly acceptable, while breaking another will automatically identify the music as “not in this tradition.” Or it might be acceptable to “break” a rule in one way but not another. Any rule may be explicit and widely recognized and discussed, or it may be so subtle that it is followed subconsciously. Meanwhile, music traditions themselves evolve, as insiders create new pieces, invent or adopt or borrow new sounds, ideas, rules, and practices, branch into different sub-genres, or develop fusions with other traditions.

At the same time, the “simultaneous sounds” aspect of music can be one of the most difficult for outsiders to hear and understand. As outsiders, they do not have the experience needed to hear groups of sounds as being “essentially the same” or as “parts of a single musical idea.” **If the music tradition that interests you strikes you as sounding “noisy” or confusing, there is no substitute for spending plenty of time just listening closely to the music, to give your brain a chance to learn to hear how the sounds are typically grouped together and related to each other.**

Many things may be happening simultaneously in a piece of music, including people playing more than one sound on one instrument, playing different sounds on similar instruments, playing instruments that make very different types of sounds, or singing or dancing to the music.

Simultaneous wavelengths in a single sound

At its most basic, the issue of simultaneity begins with the individual sounds themselves. Like other natural sounds, most musical sounds actually consist of more than one wavelength vibrating the air simultaneously to create a complex and interesting sound. In some traditions, sounds may be classified according to the complexity of the wave:

- Most music traditions include sounds, such as rattles, claps, and drum beats, that are not dominated by a particular wavelength. Instead, these "noisy" sounds include many different wavelengths that are not tightly organized. In common practice, they are described as **unpitched** or **untuned** sounds. Some unpitched instruments, such as bongo drums, are played in sets, in which smaller instruments sound higher than larger instruments, though neither has a specific wavelength or pitch.
- Many musical sounds, such as typical flute, piano, and guitar sounds, also combine different wavelengths, but the combined wave is so tightly organized (by the instrument or voice that produces them) that one wavelength very clearly predominates. We consciously hear and identify only that predominant wavelength. In common practice, such sounds are called **pitched sounds**, **pitches** or **tones**. The wavelengths that we do not consciously hear are still important, however. They add a richness to each sound that we experience as being part of its musicality. In fact, these unnoticed wavelengths are what gives each sound its distinctive quality, allowing us to distinguish our favorite singer's voice from other voices, or to distinguish between the sounds made by a flute and those made by a guitar. In common practice, this aspect of a sound is called its **timbre** or **tone quality**.
- Although pure, single-wavelength sounds are rare, a few traditions (such as computer-game music) include such sounds, usually generated by electronic technologies.

Since an individual sound is created by only one source, a tradition's "rules" for this aspect of simultaneity are the rules governing which instruments (including voices) are authentic to the tradition, and which methods and techniques of playing those instruments are encouraged. For example, a clarinet can play very "high," short-wavelength sounds or very "low," long-wavelength sounds. The high sounds do not include nearly as many wavelengths that can be heard by the human ear, so the high and low ranges of the instrument have very different timbres. Low clarinet sounds have a thicker, more resonant tone quality, and high clarinet sounds have a more direct, piercing quality. Each music tradition, style, or genre may prefer only high clarinet sounds, or only low clarinet sounds, or both, or neither.

Simultaneous sounds

At a higher level of musical complexity, different sounds may be heard at the same time, or may partially overlap. A music tradition's "rules" at this level can be varied, extensive, and complex. For example, here are some of the issues that might be relevant:

- How many participants or instruments can play "the same sound" at the same time? For example, when a wavelength is played by violin, is it produced by only one violin, or by two, or ten? Are these rules for trumpet different from those for violin? (For example, 20 violins might play the same sound, but only four trumpets.) Does a violin ever play the same wavelength as a flute, or do those instruments always play different wavelengths, or at different times? Do these rules ever change, for example organizing a piece so that sometimes many violins play together, and sometimes only one violin plays **solo** (alone)?
- What are the characteristics of sounds that can be heard simultaneously? For example, are they played on the same instrument, or on instruments that sound very different from each other (such as a flute and a drum)?
- When two sounds are both part of the music but should not sound at the same time, what is it about them that is considered incompatible? For example, are their wavelengths or timbres considered discordant?
- How is the idea "at the same time" interpreted? Is it very important that "simultaneous" sounds seem to begin and end at precisely the same time (for example, as in professional Western orchestras)? Are sounds considered "simultaneous" as long as they mostly overlap (for example, as when a group of friends sing "Happy Birthday")? Perhaps the rules governing this issue are subtle and complex (as in certain types of jazz).
- Are sounds allowed to only partially overlap in time, for example with one sound continuing while a second sound begins? If so, what are the rules for how sounds can overlap? What types of sounds are allowed to overlap each other? (Rules for this may be quite complex, and closely tied to the following issue.)

Simultaneous developments in the music

At the highest level of complexity, distinct parts of the music may develop in different ways over the same period of time. This means that not only are individual sounds blending and overlapping to form a rich overall musical sound at any specific moment, but also that musical ideas and patterns that unfold in the flow of time (for example, a melody, or a pattern of drum beats) may also be unfolding or developing over the same (short or long) period of time in the music.

Sounds that happen at the same time may be effortlessly interpreted by experienced listeners as a single musical event (for example, “a beat” consisting of two drums playing simultaneously, or “a chord” consisting of three piano sounds with different wavelengths). Musical ideas and patterns that develop in different ways over the same period of time place more demands on the listener's attention, unless the simultaneous developments are themselves so familiar that they can be heard and understood subconsciously. This level of simultaneity is probably more difficult even for insiders to learn, so most traditions have a relatively narrow range of simultaneous developments that are permitted. (In other words, many sounds that are "allowed" by the rules of the tradition may still not be "allowed" in a particular place in the music, because they would create a "too much at once" situation.) Consider, for example, the following “rules” describing “what developments may happen at the same time” in many pop and rock music genres. Songs in these traditions may depart from these rules in small ways for short times, to create interesting effects, but large departures would almost certainly signal that the music is in a different genre (such as an "alternative" rock genre that encourages complexity):

- Only one **melody** develops at a time. Most melody lines are produced by a singer (male or female), but a guitar or keyboard or wind instrument (such as saxophone) may add a melody line when the singer is not singing.
- Over the same time as the melody, a **beat** consisting primarily of a repetitive pattern of sounds is played using variety of drums, cymbals and similar instruments.

- Over the same time, a changing **harmony**, created by instruments such as guitars and keyboards, creates a background to the melody that gives it a strong sense of moving forward to an expected conclusion. The timing of harmony sounds may follow the timing in the melody, or the timing in the beat, or the harmony may set up its own repetitive patterns that fit in with the other parts (rather than competing for attention). If something complex or unusual does happen in the harmony, it does so when the melody line is very simple or absent.
- Over the same time, a single instrument (typically bass guitar, standing bass, or keyboard), may play a **bass line** that also follows or closely fits with the other parts, especially the beat and the harmony. Again, if the bass line ever competes for attention, it does so when the other parts are simplified or absent.

Simultaneities that are not sounds

Musical performances often include simultaneities that are not sounds. For example, music traditions often include simultaneous events that you see, or that you feel within your body. In some cases, these may make outsiders to the tradition feel even more overwhelmed and confused, particularly when they do not understand what is going on. However, **the additional activity may help you hear and understand what is going on in the music**. For example, when the actions of dancers are coordinated with certain sounds in the music, watching the dancers can help you hear those sounds. Similarly, if a music leader is organizing the piece using visual gestures, watching the leader may help you hear the sounds that the musicians are making in response to the gestures. Some video presentations (for example some animations) that are created to complement a specific piece of music may also help you hear what is going on in the piece.

Since prehistoric times, music has often been closely coordinated with the actions of various religious, community, and civic ceremonies. More recently, pieces from many traditions have been used to accompany the visual action in movies or games; pieces, and sometimes entire genres, of music have been created specifically for the purpose of accompanying visual presentations. In all of these cases, paying attention to the way the

sounds are coordinated with visible action may help you hear, follow, and understand what is going on in the music.

If you actively participate in the music, then another important simultaneity involves what you are feeling in your own body. Some people can become overwhelmed when they try to move and listen at the same time, but many find it useful to respond to the sounds with their bodies. For example, clapping hands, tapping feet, nodding heads, or swaying helps many people "feel" the timing of the music. Musicians often find that playing a piece helps them "hear" it properly, in part because they can associate specific sounds with the movements needed to make the sounds on their instruments.

Research simultaneity terms and concepts

As you research the music tradition that interests you, make sure you keep notes that will help you remember what you have found and where you found it. In particular, you may want to be able to easily find favorite audio or video examples that demonstrate the different types of simultaneity in the tradition.

Because simultaneity in music includes different topics that are usually treated as separate aspects of a tradition, you may want to focus on the aspect of simultaneity that most interests you at the moment. As with any of these modules, you can repeat the activities as many times as you like, focusing on different topics (or on the same one in greater depth) each time. **If you are not certain what aspect of simultaneity interests you, try doing the listening activity before you do the research**; you may prefer to begin by learning about a simultaneity that is easy for you to hear and identify in the music.

Some music traditions have general terms for the different aspects of simultaneity. For example, common-practice theory uses the term **timbre** to describe the aspect of a musical sound that is due to the combination of different wavelengths that make up the sound. The term **harmony** is used to describe the combination of sounds of different wavelengths that are played at the same time. The term **texture** is used to describe the ways that

different developments may happen over the same period of time in the music. You may find these to be useful search terms, even in discussions of other music traditions. “Timbre” in particular is also used in scientific and engineering discussions of sound.

You may want to search in the tradition that interests you for specific **terms that name the ways that different sounds are combined**. For example, the way that simultaneous sounds with different wavelengths are combined to create harmony is the most complex aspect of common practice music. For this reason, there are a very large number of terms that name the wavelength relationships in these combinations. Here is a small sample:

- Minor chord
- C chord
- Dominant chord
- Major seventh chord
- IV chord (with “IV” representing the Roman numeral “four”)
- Suspended 4 chord (not at all the same thing as a “IV chord”)
- Arpeggiated chord

When an aspect of a tradition includes terminology as complex and specific as that for common practice harmony, this can signal a particularly challenging topic. Other topics may feature **terminology that is less complex, more descriptive, and relatively easy to understand**, given suitable examples. For example, in common practice, timbre is primarily viewed as part of instrument technique, rather than formal music theory. Most timbre terms are informal and descriptive, for example describing an instrument sound as:

- Hollow
- Reedy
- Breathy
- Piercing
- Buzzng
- Crashing
- Muddy

Whatever the music tradition, you may find that **terms that describe the simultaneous wavelengths within each sound** are unusually accessible even to outsiders, since most musicians do not need a formal theory of this aspect of music. However, there are exceptions to this rule, for example among the musicians who consciously choose and control wavelengths to construct "virtual instrument" sounds. If this topic particularly interests you, you may want to focus on learning about the instruments used in the tradition, or the **techniques used to play the instruments**, or you may want to **search among scientific, engineering, and music technology literature for discussions of instrument timbre and acoustics**.

You may want to search for **terms that describe the way that different developments in the music may happen at the same time**. For example, common practice theory recognizes various **textures** of music, including:

- **Monophonic** - only one melody develops at a time, with or without sounds that do not have a specific wavelength (such as most drum sounds)
- **Homophonic** - only one melody develops at a time, accompanied by harmony that develops in a close relationship with it, as in the "pop and rock" example above
- **Contrapuntal** - more than one melody develops independently over the same period of time, in the context of a harmony that is suitable to all of the melodies simultaneously, as in a "round" or a Bach fugue

Again, such terminologies can vary from easily-accessible-to-outsiders to difficult-to-learn-even-for-insiders, depending on how specific and complex the rules and theory are. For example, the rules for how to combine the raga and tala (the wavelength and timing) aspects of classical Indian music are quite complex and challenging for outsiders to understand and learn. Similarly, the rules for contrapuntal melodies in common practice are also quite strict and challenging to learn, and include terms with meanings that are not obvious, such as "species," "countersubject," and "stretto." In contrast, the rules for constructing common-practice melodies for homophonic music are not so strict, and descriptions of such melodies often use informal, easy-to-grasp terms such as "call and response," "phrase," and "contour."

You may also find that a tradition includes **terms that name a sound or a group of sounds according to its place or relationships within a combination**. For example, in common practice harmony, a particular sound may be named “F sharp.” However, it can also have additional names that define how it is being used when it is combined with other sounds (for example, it may also be “the root of the chord” or “the tonic of the key”).

You may also find that a tradition includes **terms that name or describe different sounds that are not simultaneous, but that happen over the same period of time to create a single unified development**. One example of this is a **call-and-response** melody, in which the leader's part alternates with the responders' part. Although the parts themselves may never overlap, their alternation over a period of time creates a single melodic development. Another example is repetitive timing patterns (“beats”) that are created when various drums play at different times in the pattern. In common practice, such parts are often described as **interlocking**. Although the individual sounds do not happen at the same time, their repetition within the same time frame creates one distinctive effect in the music. You may want to search within the tradition that interests you for mention of “interlocking” parts or for similar terms and descriptions.

You may also want to research **the cultural roots and meanings of the rules regarding simultaneity in a music tradition**. For example:

- What other things (such as dancing, ceremonial actions, or pictures on a screen) are expected, or permitted, to happen at the same time? How closely are they expected to coordinate with specific events in the music? Does this create cultural meanings for specific types of sounds (for example, a certain type of bell sound being associated with a specific religious action)?
- Which participants are expected to make each kind of sound (for example, clapping sounds as opposed to flute sounds)? What is the effect on the simultaneity of the musical sounds, and what cultural roles do each of these participants have? (For example, if only the music leader may play a flute, while anyone may clap, then simultaneous flute sounds would not be expected, and the cultural meaning of a flute sound might include “lone leadership”).

Listen for simultaneity in the music

1. Choose two or three pieces of music in the tradition that interests you. If possible, choose pieces that sound to you quite different from each other, to gain some perspective on the variety within the tradition.
2. Focus on the particular aspect of simultaneity that interests you at the moment, or terms of interest that you discovered in your research. Listen for examples in the pieces. If you believe the pieces do not include any examples of the simultaneity that interests you, try listening to other pieces from the tradition. If you are uncertain whether they include examples, any of the following may help: Listen to the simplest pieces you can find that might contain such examples. If your research turned up the names of specific pieces that are discussed as examples, listen to recordings of those pieces. If you understand the concept well enough to play it on an instrument, use the joining in activity to check on possible examples (for example, playing an instrument can help you check on whether a particular aspect of harmony is included). If you can read the the tradition's music notation, a notated version of the piece may help you spot or confirm examples. If none of these suggestions helps, you may prefer to listen for a different simultaneity topic, aspect or term.
3. In any of the pieces that you have listened to, select a period of time that you believe includes examples of the type of simultaneity that interests you.
4. As best you can, analyze that portion of the piece for that type of simultaneity. For example, if “interlocking parts” interests you, describe or notate or analyze the way that the parts interlock. If simultaneous sounds with different wavelengths interest you, analyze that aspect of the music as best you can. If simultaneous development interests you, create a chart showing the different ways that the music is developing simultaneously over that period of time. Your analysis can use any mixture of notations and terms from the tradition that interests you, notations and terms from a more familiar tradition, and your own informal notes and descriptions; the main goal is to create a guide that helps you understand and follow what is going on in the music.

Join in simultaneously

- Do this activity with the same portion of music that you analyzed in the previous activity. You can use voice, body percussion, or any authentic or familiar instrument that seems appropriate and is comfortable for you.
- Use the analysis you created in the previous activity as a guide to help you join in as you listen to the piece. For example, if you analyzed "interlocking" parts, use your analysis to sing or play along with one of the interlocking parts. If you analyzed an aspect of the harmony, try to join in with the harmony. If you analyzed the way different parts developed simultaneously, join in with one of those parts.
- If you are not satisfied with your efforts at joining in, you may want to try adding to your analysis so that it provides more information that will help you join in, or you may want to try analyzing and joining in with a different period of time, in that piece or a different piece, that has simultaneities that are simpler, easier for you to hear, or easier for you to join in with.
- If you are ready for an extra challenge, see whether you can switch to a different part. For example, if you joined in one developing part in a "simultaneous development," try to switch to a part that develops over the same time in a different way.

Play with simultaneity

- If you enjoy using recording, digital audio workstation, or other modern technologies to create music, these may provide the easiest way to explore simultaneity. Using such technologies allows you to develop music of your own that is more complex, with more simultaneities, than you could perform alone. You may want to explore the topic that interests you by using music technologies to create your own works. Possibilities include compositions that sound authentic to the tradition, arrangements that use familiar sounds with the simultaneity rules for that tradition, or arrangements that use sounds from that tradition with the simultaneity rules of a more familiar tradition.

- If you regularly play with other musicians who might be interested in exploring the aspect of simultaneity that you have researched, you may want to set up a session in which you can play with the relevant concepts as a group. For example, the group might want to try performing the interlocking parts or harmonies that you charted in the listening activity above.
- You may want to research the participation roles that are common in the music tradition that interests you, to see whether there are any that include creating simultaneous or overlapping sounds (for example, as played on a guitar or piano), or distinct simultaneous parts (such as singing one part while playing another) or interlocking parts (such as playing an interlocking pattern on two bongo drums), or creating sounds at the same time as doing something else (such as dancing or marching), or leading or cuing other musicians so that simultaneities can be closely coordinated (such as the conductor of a Western orchestra). Watching live performances or videos of live performances may provide useful clues. Do you suspect that any of these simultaneities might be feasible for you? If so, choose the one that you think might be easiest and try to practice it.
- If you play an instrument and timbre is of particular interest to you, you may want to experiment with using your instrument to produce timbres similar to those that you have been studying, or you may simply want to use your instrument to experiment with timbre in general. Don't forget about the timbre possibilities offered by specialized techniques for bowing, plucking, breathing, and other instrument actions, or by specialized equipment such as mutes, capos, plectrums, and electronic sound modifiers and processors. You may find it interesting or useful to research whether the technique or equipment you are using eliminates wavelengths from the sound (e.g. “playing harmonics”), or adds wavelengths (e.g. electronic “distortion”).

Connect simultaneity to other aspects of music

- An organization concept may affect simultaneity choices. For example, in typical jazz forms, a repeated background (the “changes”) is supposed to be played at the same time as a set melody in some

sections, but at the same time as an improvised melody in other sections.

- The ways that music is remembered may affect issues of simultaneity. For example, in music traditions in which different parts develop in different ways over the same time, listeners may accurately remember only the most obvious, loudest, or easiest-to-understand part.
- Simultaneity also affects participation in the music. For example, some roles (such as playing the saxophone and singing) cannot be performed by the same person simultaneously.
- The ways that instruments are played also create simultaneity issues. For example, some instruments can easily play multiple sounds at the same time, while others can only play one musical sound at a time.
- Simultaneity is strongly tied to the volume aspect of music. For example, as a general rule, more sounds happening at the same time will make the music louder.
- The flow of time is of course closely tied to all simultaneity issues. For example, whether sounds are perceived as “simultaneous” depends on how closely they overlap each other over the flow of time.
- Simultaneity is also strongly tied to the wavelength aspect of the music. For example, many traditions have rules regarding tuning (permitted wavelengths) that are dictated by their sense that of which wavelengths sound pleasant when heard at the same time.